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TRAVELS
INTO
NORTH AMERICA;

CONTAINING
ITS NATURAL HISTORY, AND
A circumstantial Account of its Plantations
and Agriculture in general,

WITH THE
CIVIL, ECCLESIASTICAL AND COMMERCIAL
STATE OF THE COUNTRY,

The MANNERS of the INHABITANTS, and several curious
and IMPORTANT REMARKS on various Subjects.

By PETER KALM,
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Finland, and Member of the *Swedish* Royal Academy of
Sciences.

TRANSLATED INTO ENGLISH,
By JOHN REINHOLD FORSTER, F. A. S.

Enriched with a Map, several Cuts for the Illustration of
Natural History, and some additional Notes.

V O L. II.

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PETER KALM'S
TRAVELS.

New Jersey, Raccoon.

December the seventh, 1748.

IN the morning I undertook again a little journey, to *Raccoon*, in *New Jersey*.

It does not seem difficult to find out the reasons, why the people multiply more here than in *Europe*. As soon as a person is old enough, he may marry in these provinces, without any fear of poverty; for there is such a tract of good ground yet uncultivated, that a new-married man can, without difficulty, get a spot of ground, where he may sufficiently subsist with his wife and children. The taxes are very low, and he

need not be under any concern on their account. The liberties he enjoys are so great, that he considers himself as a prince in his possessions. I shall here demonstrate by some plain examples, what effect such a constitution is capable of.

MAONS KEEN, one of the *Swedes* in *Raccoon*, was now near seventy years old: he had many children, grandchildren, and great-grandchildren; so that, of those who were yet alive, he could muster up forty-five persons. Besides them, several of his children and grandchildren died young, and some in a mature age. He was, therefore, uncommonly blessed. Yet his happiness is not comparable to that which is to be seen in the following examples, and which I have extracted from the *Philadelphia* gazette.

IN the year 1732, *January* the 24th, died at *Ipswich*, in *New England*, Mrs. *Sarah Tutbil*, a widow, aged eighty-six years. She had brought sixteen children into the world; and from seven of them only, she had seen one hundred and seventy-seven grandchildren and great-grandchildren.

IN the year 1739, *May* the 30th, the children, grand and great-grandchildren, of Mr. *Richard Buttington*, in the parish of *Chester*, in *Pensylvania*, were assembled in his

his house ; and they made together one hundred and fifteen persons. The parent of these children, *Richard Buttington*, who was born in *England*, was then entering into his eighty-fifth year : and was at that time quite fresh, active, and sensible. His eldest son, then sixty years old, was the first *Englishman* born in *Pennsylvania*.

In the year 1742, on the 8th of *January*, died at *Trenton*, in *New Jersey*, Mrs. *Sarah Furman*, a widow, aged ninety-seven years. She was born in *New England* ; and left five children, sixty-one grandchildren, one hundred and eighty-two great-grandchildren, and twelve great-great-grandchildren, who were all alive when she died.

In the year 1739, on the 28th of *January*, died at *South Kingston*, in *New England*, Mrs. *Maria Hazard*, a widow, in the hundredth year of her age. She was born in *Rhode Island*, and was a grandmother of the then vice-governor of that island, Mr. *George Hazard*. She could count altogether five hundred children, grandchildren, great-grandchildren, and great-great-grandchildren. When she died, two hundred and five persons of them were alive ; a granddaughter of hers had already been grandmother near fifteen years.

In this manner, the usual wish or blessing in our liturgy, that the new-married couple

may see their grandchildren, till the third and fourth generation, has been literally fulfilled in regard to some of these persons *.

December the 9th. In every country, we commonly meet with a number of insects; of which many, though they be ever so small and contemptible, can do considerable damage to the inhabitants. Of these dangerous insects, there are likewise some in *North America*: some are peculiar to that country, others are common to *Europe* likewise.

I HAVE already, in the preceding volume, mentioned the *Mosquitoes*, as a kind of disagreeable gnats; and another noxious insect, the *Bruchus Pisi*, which destroys whole fields with pease. I shall here add some more.

There are a kind of *Locusts*, which about every seventeenth year come hither in incredible numbers. They come out of the ground in the middle of *May*, and make, for six weeks together, such a noise in the trees and woods, that two persons who meet in such places, cannot understand each other, unless they speak louder than the locusts can chirp. During that time, they make, with the sting in their tail, holes into the soft bark of the little branches on the trees, by which means these branches are ruined.

* Mr. *Kalm* speaks here of the *Swedish* Liturgy.

ruined. They do no other harm to the trees or other plants. In the interval between the years when they are so numerous, they are only seen or heard single in the woods.

THERE is likewise a kind of *Caterpillars* in these provinces, which eat the leaves from the trees. They are also innumerable in some years. In the intervals there are but few of them : but when they come, they strip the trees so entirely of their leaves, that the woods in the middle of summer are as naked as in winter. They eat all kinds of leaves, and very few trees are left untouched by them ; as, about that time of the year the heat is most excessive. The stripping the trees of their leaves has this fatal consequence, that they cannot withstand the heat, but dry up entirely. In this manner, great forests are sometimes entirely ruined. The *Swedes* who live here shewed me, here and there, great tracts in the woods, where young trees were now growing, instead of the old ones, which, some years ago, had been destroyed by the caterpillars. These caterpillars afterwards change into moths, or *phalænæ*, which shall be described in the sequel, in their proper places.

IN other years the *Grass-worms* do a great deal of damage in several places, both in the meadows and corn-fields. For the

fields are at certain times over-run with great armies of these worms, as with the other insects; yet it is very happy that these many plagues do not come all together. For in those years when the locusts are numerous, the caterpillars and grass-worms are not very considerable, and it happens so with the latter kinds, so that only one of the three kinds comes at a time. Then there are several years when they are very scarce. The grass-worms have been observed to settle chiefly in a fat soil; but as soon as careful husbandmen discover them, they draw narrow channels with almost perpendicular sides quite round the field in which the worms are settled; then by creeping further they all fall into the ditch, and cannot get out again. I was assured by many persons that these three sorts of insects followed each other pretty closely; and that the locusts came in the first year, the caterpillars in the second, and the grass-worms in the last: I have likewise found by my own experience that this is partly true.

MOTHS, or *Tineæ*, which eat the clothes, are likewise abundant here. I have seen cloth, worsted gloves, and other woollen stuffs, which had hung all the summer locked up in a shrine, and had not been
taken

taken care of, quite cut through by these worms, so that whole pieces fell out: Sometimes they were so spoiled that they could not be mended again. Furs which had been kept in the garret were frequently so ruined by worms, that the hair went off by handfuls. I am however not certain whether these worms were originally in the country, or whether they were brought over from *Europe*.

FLEAS are likewise to be found in this part of the world. Many thousands were undoubtedly brought over from other countries; yet immense numbers of them have certainly been here since time immemorial. I have seen them on the grey squirrels, and on the hares which have been killed in such desert parts of this country, where no human creature ever lived. As I afterwards came further up into the country, and was obliged to lie at night in the huts and beds of the *Indians*, I was so plagued by immense quantities of fleas, that I imagined I was put to the torture. They drove me from the bed, and I was very glad to sleep on the benches below the roof of the huts. But it is easy to conceive that the many dogs which the *Indians* keep, breed fleas without end. Dogs and men lie promiscuously in the huts;

huts; and a stranger can hardly lie down and shut his eyes, but he is in danger of being either squeezed to death, or stifled by a dozen or more dogs, which lie round him, and upon him, in order to have a good resting place. For I imagine they do not expect that strangers will venture to beat them or throw them off, as their masters and mistresses commonly do.

THE noisy *Crickets* (*Gryllus domesticus*) which are sometimes to be met with in the houses in *Sweden*, I have not perceived in any part of *Pensylvania* or *New Jersey*, and other people whom I have asked, could not say that they had ever seen any. In summer there are a kind of *black Crickets** in the fields, which make exactly the same chirping noise as our house crickets. But they keep only to the fields, and were silent as soon as winter or the cold weather came on, They say it sometimes happens that these field crickets take refuge in houses, and chirp continually there, whilst it is warm weather, or whilst the rooms are warm; but as soon as it grows cold they are silent. In some parts of the province of *New York*, and in *Canada* every farm-

* Perhaps it is the *Gryllus campestris*, or common black field cricket of Europe, of which *Rocfel* in his work on insects, vol. 2, Gryll. f. 13. has given a fine drawing. F.

farm-house and most of the houses in the towns, swarm with so many, that no farm-house in our country can be better stocked with them. They continue their music there throughout the whole winter.

BUGS (*Cimex lectularius*) are very plentiful here. I have been sufficiently tormented by them, in many places in *Canada*: But I do not remember having seen any with the *Indians*, during my stay at *Fort Frederic*. The commander there, Mr. *de Loufignan*, told me, that none of the *Illinois* and other *Indians* of the western parts of *North America* knew any thing of these vermin. And he added, that he could with certainty say this from his own experience, having been among them for a great while. Yet I cannot determine whether bugs were first brought over by the *Europeans*, or whether they have originally been in the country. Many people looked upon them as natives of this country, and as a proof of it said, that under the wings of bats the people had often found bugs, which had eaten very deep into the flesh. It was therefore believed that the bats had got them in some hollow tree, and had afterwards brought them into the houses, as they commonly fix themselves close to the walls, and creep into the little chinks which they

they meet with. But as I have never seen any bugs upon bats, I cannot say any thing upon that subject. Perhaps a louse or a tick (*Acarus*) has been taken for a bug. Or, if a real bug has been found upon a bat's wing, it is very easy to conceive that it fixed on the bat, whilst the latter was sitting in the chinks of a house stocked with *European* bugs.

As the people here could not bear the inconvenience of these vermin, any more than we can in *Sweden*, they endeavoured to expel them by different means. I have already remarked in the preceding volume, that the beds to that purpose were made of *Sassafras* wood, but that they were only temporary remedies. Some persons assured me that they had found from their own experience, and by repeated trials, that no remedy was more effectual towards the expulsion of bugs, than the injecting of boiling water into all the cracks where they are settled, and washing all the wood of the beds with it; this being twice or thrice repeated, the bugs are wholly destroyed. But if there are bugs in neighbouring houses, they will fasten to ones clothes, and thus be brought over into other houses.

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good or no, as I have not tried them; but by repeated trials I have been convinced that sulphur, if it be properly employed, entirely destroys bugs and their eggs in beds and walls, though they were ten times more numerous than the ants in an ant-hill*.

THE *Mill-beetles*, or *Cock-roaches*, are likewise a plague of *North America*, and are settled in many of its provinces. The learned Dr. *Colden* was of opinion that these insects were properly natives of the *West Indies*, and that those that were found in *North America* were brought over from those islands. To confirm his opinion, he said, that it was yet daily seen how the ships coming with goods from the *West Indies* to *North America* brought mill-beetles with them in great numbers. But from the observations which I have made in this country, I have reason to believe that these insects have been on the continent of *North America* since time immemorial. Yet notwithstanding this I do not deny their being brought over from the *West Indies*. They are in almost every house in the city of *New York*; and those are undoubtedly come over with ships. But how can that be

* A still more infallible remedy, is to wash all the furniture, infested with that vermin, with a solution of arsenic, F.

be said of those mill-beetles, which are found in the midst of the woods and deserts?

THE *English* likewise call the *Mill-beetles*, *Cock-roaches*, and the *Dutch* give them the name of *Kackerlack*. The *Swedes* in this country call them *Brodoetare*, or *Bread-eaters*, on account of the damage they do to the bread, which I am going to describe. Dr. *Linnaeus* calls them *Blatta Orientalis*. Many of the *Swedes* call them likewise *Kackerlack*. They are not only observed in the houses, but in the summer they appear often in the woods, and run about the trees, which are cut down. On bringing in all sorts of old rotten blocks of wood for fuel, in *February*, I discovered several cock-roaches settled in them; they were at first quite torpid, or as it were dead; but after lying in the room for a while, they recovered, became very lively, and began to run about. I afterwards found very often, that when old rotten wood was brought home in winter, and cut in pieces for fuel, the cock-roaches were got into it in numbers, and lay in it in a torpid state. In the same winter, a fellow cut down a great dry tree, and was about to split it. I then observed in a crack, some fathoms above the ground,

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several cock-roaches together with the common ants. They were, it seems, crept up a great way, in order to find a secure place of abode against winter. On travelling in the middle of *October* 1749, through the uninhabited country between the *English* and *French* colonies, and making a fire at night near a thick half rotten tree, on the shore of lake *Champlain*, numbers of cock-roaches came out of the wood, being wakened by the smoke and the fire, which had driven them out of their holes. The *Frenchmen*, who were then in my company, did not know them, and could not give them any name. In *Canada* the *French* did not remember seeing any in the houses. In *Pensylvania*, I am told, they run in immense numbers about the sheaves of corn, during the harvest. At other times they live commonly in the houses in the *English* settlements, and lie in the crevices, especially in the cracks of those beams which support the ceiling, and are nearest to the chimney.

THEY do a deal of damage by eating the soft parts of the bread. If they have once made a hole into a loaf, they will in a little time eat all the soft part in it, so that on cutting the loaf, nothing but the crust is left. I am told they likewise eat other victuals.

viſtuals. Sometimes they bite people's noſes or feet, whiſt they are aſleep. An old Swede, called *Sven Laock*, a grandſon of the Rev. Mr. *Laockenius*, one of the firſt *Swediſh* clergymen that came to *Pennſylvania*, told me, that he had in his younger years been once very much frightened on account of a cock-roach, which crept into his ear whiſt he was aſleep. He waked ſuddenly, jumped out of bed, and felt that the inſect, probably out of fear, was endeavouring with all its ſtrength to get deeper. Theſe attempts of the cock-roach were ſo painful to him, that he imagined his head was burſting, and he was almoſt ſenſeleſs; however he haſtened to the well, and bringing up a bucket full of water, threw ſome into his ear. As ſoon as the cock-roach found itſelf in danger of being drowned, it endeavoured to ſave itſelf, and pushed backwards out of the ear, with its hind feet, and thus happily delivered the poor man from his fears.

THE *Wood-lice* are diſagreeable inſects, which in a manner are worſe than the preceding; but as I have already deſcribed them in a peculiar memoir, which is printed among the memoirs of the Royal Academy

Academy of Sciences for the year 1754, I refer my readers to that account.

December the 11th. THIS morning I made a little excursion to *Penn's Neck*, and further over the *Delaware* to *Wilmington*. The country round *Penn's Neck* has the same qualities as that about other places in this part of *New Jersey*. For the ground consists chiefly of sand, with a thin stratum of black soil. It is not very hilly, but chiefly flat, and in most places covered with open woods of such trees as have annual leaves, especially oak. Now and then you see a single farm; and a little corn field round it. Between them are here and there little marshes or swamps, and sometimes a brook with water, which has a very slow motion.

THE woods of these parts consist of all sorts of trees, but chiefly of oak and hickory. These woods have certainly never been cut down, and have always grown without hindrance. It might therefore be expected that there are trees of an uncommon great age to be found in them; but it happens otherwise, and there are very few trees three hundred years old. Most of them are only two hundred years old; and this convinced me that trees have the same quality as animals, and die after

they are arrived at a certain age. Thus we find great woods here, but when the trees in them have stood an hundred and fifty or an hundred and eighty years, they are either rotting within, or losing their crown, or their wood becomes quite soft, or their roots are no longer able to draw in sufficient nourishment, or they die from some other cause. Therefore when storms blow, which sometimes happens here, the trees are broke off either just above the root, or in the middle, or at the summit. Several trees are likewise torn out with their roots by the power of the winds. The storms thus cause great devastations in these forests. Every where you see trees thrown down by the winds, after they are too much weakened by one or the other of the above mentioned causes to be able to resist their fury. Fire likewise breaks out often in the woods, and burns the trees half way from the root, so that a violent gust of wind easily throws them down.

On travelling through these woods, I purposely tried to find out, by the position of the trees which were fallen down, which winds are the strongest hereabouts. But I could not conclude any thing with certainty, for the trees fell on all sides, and lay towards all the points of the compass.

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I therefore judged, that any wind which blows from that side where the roots of the tree are weakest and shortest, and where it can make the least resistance, must root it up and throw it down. In this manner the old trees die away continually, and are succeeded by a young generation. Those which are thrown down ly on the ground and putrify, sooner or later, and by that means encrease the black soil, into which the leaves are likewise finally changed, which drop abundantly in autumn, are blown about by the winds for some time, but are heaped up, and lie on both sides of the trees, which are fallen down. It requires several years before a tree is intirely reduced to dust. When the winds tear up a tree with the roots, a quantity of loose soil commonly comes out with and sticks to them for some time, but at last it drops off; and forms a little hillock, which is afterwards augmented by the leaves, which commonly gather about the roots. Thus several inequalities are formed in the woods, such as little holes and hills; and by this means the upper soil must likewise be heaped up in such places.

Some trees are more inclined to putrify than others. The *tupelo-tree* (*Nyssa*), the

tulip-tree (*Liriodendron*), and the *sweet gum-tree* (*Liquidambar*), became rotten in a short time. The *biccorey* did not take much time, and the *black oak* fell sooner to pieces than the *white oak*; but this was owing to circumstances. If the bark remained on the wood, it was for the greatest part rotten, and entirely eaten by worms within, in the space of six, eight, or ten years, so that nothing was to be found but a reddish brown dust. But if the bark was taken off, they would often lie twenty years before they were entirely rotten. The suddenness of a tree's growth, the bigness of its pores, and the frequent changes of heat and wet in summer, cause it to rot sooner. To this it must be added, that all sorts of insects make holes into the stems of the fallen trees, and by that means the moisture and the air get into the tree, which must of course forward putrefaction. Most of the trees here have deciduous or annual leaves. Many of them begin to rot whilst they are yet standing and blooming. This forms the hollow trees, in which many animals make their nests and places of refuge.

THE breadth of the *Delaware* directly opposite *Wilmington* is reckoned an *English* mile and a half; yet to look at it, it did
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not seem to be so great. The depth of the river, in the middle, is said to be from four to six fathoms here.

December the 12th. THE Joiners say, that among the trees of this country they chiefly use the *black walnut-trees*, the *wild cherry-trees*, and the *curled maple*. Of the *black walnut-trees* (*Juglans nigra*) there is yet a sufficient quantity. However careless people take pains enough to destroy them, and some peasants even use them as fuel. The wood of the *wild cherry-trees* (*Prunus Virginiana*) is very good, and looks exceedingly well; it has a yellow colour, and the older the furniture is, which is made of it, the better it looks. But it is already difficult to get at it, for they cut it every where, and plant it no where. The *curled maple* (*Acer rubrum*) is a species of the common red maple, but likewise very difficult to be got. You may cut down many trees without finding the wood which you want. The wood of the *sweet gum-tree* (*Liquidambar*) is merely employed in joiner's work, such as tables, and other furniture. But it must not be brought near the fire, because it warps. The firs and the *white cedars* (*Cupressus thyoides*) are likewise made use of by the joiners for different sorts of work.

THE millers who attended the mill which stood here, said, that the axle-trees of the wheels of the mill were made of *white oak*, and that they continued good three or four years, but that the fir-wood does not keep so well. The cogs of the mill-wheel, and the pullics, are made of the wood of the white walnut-tree, because it is the hardest which can be got here. The wood of *mulberry-trees* is of all others reckoned the most excellent for pegs and plugs in ships and boats.

AT night I went over the river *Delaware*, from *Willmington*, to the ferrying-place, on the *New Jersey* side.

December the 13th. In the morning I returned to *Raccoon*.

ON many trees in the woods of this country, either on one of the sides, or in the middle of a branch, or round a branch, are greater or lesser *knobs* or excrescences. Sometimes there is only a single one in a tree. In the size there is a considerable difference, for some of these knobs are as big and bigger than a man's head, others are only small. They project above the surface of the tree, like a tumor. Sometimes a tree was quite covered with them. They do not ly on one side only, but often form a circle round a branch, and even round

round the stem itself. The trees which have these knobs are not always great ones, but some not above a fathom high. The knobs commonly consist of the same parts as the wood itself, and look within like curled wood. Some of them are hollow. When a knob on a little tree is cut open, we commonly find a number of little worms in it, which are sometimes also common in the greater knobs. This shews the origin of the knobs in general. The tree is stung by insects, which lay their eggs under the bark, and from the eggs worms are afterwards hatched. They occasion an extravasation of the sap, which gradually condenses into a knob. Only the trees with annual deciduous leaves have these knobs, and among them chiefly the oak, of which again the black and *Spanish* oak have the greatest abundance of knobs. The *ash* trees, (*Fraxinus excelsior*) and the *red maple* (*Acer rubrum*) likewise have enough of them. Formerly the *Swedes*, and more especially the *Finlanders*, who are settled here, made dishes, bowls, &c. of the knobs which were on the ash-trees. These vessels, I am told, were very pretty, and looked as if they were made of curled wood. The oak-knobs cannot be employed in this manner, as they are commonly

worm-eaten and rotten within. At present the *Swedes* no longer make use of such bowls and dishes, but make use of earthen ware, or vessels made of other wood. Some knobs are of an uncommon size, and make a tree have a monstrous appearance. Trees with knobs are very common in the woods of this country *.

THE roads are good or bad according to the difference of the ground. In a sandy soil the roads are dry and good; but in a clayey one they are bad. The people here are likewise very careless in mending them. If a rivulet be not very great, they do not make a bridge over it; and travellers may do as well as they can to get over: Therefore many people are in danger of being drowned in such places, where the water
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* In *Siberia*, and in the province of *Wiatka*, in the government of *Cazan*, in *Russia*, the inhabitants make use of the knobs, which are pretty frequently found in birches, to make bowls and other domestic utensils thereof. They are turned, made pretty thin, and covered with a kind of varnish, which gives them a pretty appearance; for the utensil looks yellow, and is marbled quite in a picturesque manner, with brown veins. The best kind of these vessels are made so thin that they are semi-diaphanous, and when put into hot water they grow quite pliant, and may be formed by main force, quite flat, but when again left to themselves, and grown cold, they return to their original shape. This kind of wood is called, in *Russia*, *Kap*, and the vessels made of it, *kap-powie Tchasbki*, and are pretty high in price, when they are of the best kind, and well varnished. F.

is risen by a heavy rain. When a tree falls across the road, it is seldom cut off, to keep the road clear, but the people go round it. This they can easily do, since the ground is very even, and without stones; has no underwood or shrubs, and the trees on it stand much asunder. Hence the roads here have so many bendings.

THE farms are most of them single, and you seldom meet with even two together, except in towns, or places which are intended for towns; therefore there are but few villages. Each farm has its corn-fields, its woods, its pastures and meadows. This may perhaps have contributed something towards the extirpation of wolves, that they every where met with houses, and people who fired at them. Two or three farm-houses have generally a pasture or a wood in common, and there are seldom more together; but most of them have their own grounds divided from the others.

December the 18th. ALL persons who intend to be married, must either have their banns published three times from the pulpit, or get a licence from the governor. The banns of the poorer sort of people only are published, and all those who are a little above them get a licence from the governor. In that licence he declares that he has examined the affair, and found no obstacles

stacles to hinder the marriage, and therefore he allows it. The licence is signed by the governor; but, before he delivers it, the bridegroom must come to him in company with two creditable and well known men, who answer for him, that there really is no lawful obstacle to his marriage. These men must subscribe a certificate, in which they make themselves answerable for, and engage to bear all the damages of, any complaints made by the relations of the persons who intend to be married, by their guardians, their masters, or by those to whom they may have been promised before. For all these circumstances the governor cannot possibly know. They further certify that nothing hinders the intended marriage, and that nothing is to be feared on that account. For a licence they pay five and twenty shillings in *Pennsylvanian* money, at *Philadelphia*. The governor keeps twenty shillings, or one pound, and the remaining five shillings belong to his secretary. The licence is directed only to protestant clergymen. The quakers have a peculiar licence to their marriages. But as it would be very troublesome, especially for those who live far from the governor's residence to come up to town for every licence, and to bring the men with them
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who are to answer for them, the clergymen in the country commonly take a sufficient number of licences and certificates, which are ready printed, with blanks left for the names; they give them occasionally, and get the common money, one pound, five shillings, for each of them, besides something for their trouble. The money that they have collected, they deliver to the governor as soon as they come to town, together with the certificates, which are signed by two men, as above-mentioned; they then take again as many licences as they think sufficient: from hence we may conceive that the governors in the *English North American* colonies, besides their salaries, have very considerable revenues *.

THERE is a great mixture of people of all sorts in these colonies, partly of such as are lately come over from *Europe*, and partly of such as have not yet any settled place of abode. Hence it frequently happens that when a clergyman has married such a couple,

* Though it is very desirable, that the members of the church of *England* may enjoy the same religious liberty in *America* as the rest of their fellow-subjects, and have every part of their religious establishment among themselves, and that therefore bishops might be introduced in *America*, it is however to be feared this will prove one of the obstacles to the introducing of *English* bishops in that part of the world.

couple, the bridegroom says he has no money at present, but would pay the fee at the first opportunity : however he goes off with his wife, and the clergyman never gets his due. This proceeding has given occasion to a custom which is now common in *Maryland*. When the clergyman marries a very poor couple, he breaks off in the middle of the Liturgy, and cries out, *Where is my fee?* The man must then give the money, and the clergyman proceeds ; but if the bridegroom has no money, the clergyman defers the marriage till another time, when the man is better provided. People of fortune, of whom the clergyman is sure to get his due, need not fear this disagreeable question, when they are married.

HOWEVER, though the parson has got licences to marry a couple, yet if he be not very careful, he may get into very disagreeable circumstances ; for in many parts of the country there is a law made, which, notwithstanding the governor's licence, greatly limits a clergyman in some cases. He is not allowed to marry a couple who are not yet of age, unless he be certain of the consent of their parents. He cannot marry such strangers as have bound themselves to serve a certain number of years, in order to

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to pay off their passage from *Europe*, without the consent of their masters; if he acts without their consent, or in opposition to it, he must pay a penalty of fifty pounds, *Pensylvania* currency, though he has the licence, and the certificate of the two men who are to answer for any objection. But parents or masters give themselves no concern about these men, but take hold of the clergyman, who is at liberty to prosecute those who gave him the certificate, and to get his damages repaid. With the consent of the parents and masters he may marry people without danger to himself. No clergyman is allowed to marry a negro with one of *European* extraction, or he must pay a penalty of one hundred pounds, according to the laws of *Pensylvania*.

THERE is a very peculiar diverting custom here, in regard to marrying. When a man dies, and leaves his widow in great poverty, or so that she cannot pay all the debts with what little she has left, and that, notwithstanding all that, there is a person who will marry her, she must be married in no other habit than her shift. By that means, she leaves to the creditors of her deceased husband her cloaths, and every thing which they find in the house. But she is not obliged

obliged to pay them any thing more, because she has left them all she was worth, even her cloaths, keeping only a shift to cover her, which the laws of the country cannot refuse her. As soon as she is married, and no longer belongs to the deceased husband, she puts on the cloaths which the second has given her. The *Swedish* clergymen here have often been obliged to marry a woman in a dress which is so little expensive, and so light. This appears from the registers kept in the churches, and from the accounts given by the clergymen themselves. I have likewise often seen accounts of such marriages in the *English* gazettes, which are printed in these colonies; and I particularly remember the following relation: A woman went, with no other dress than her shift, out of the house of her deceased husband to that of her bridegroom, who met her half way with fine new cloaths, and said, before all who were present, that he lent them his bride; and put them on her with his own hands. It seems, he said that he lent the cloaths, lest, if he had said he gave them, the creditors of the first husband should come, and take them from her; pretending, that she was looked upon as the relict of her first husband, before she was married to the second.

December the 21st. It seems very probable, from the following observations, that long before the arrival of the *Swedes*, there have been *Europeans* in this province; and, in the sequel, we shall give more confirmations of this opinion. The same old *Maons Keen*, whom I have already mentioned before, told me repeatedly, that on the arrival of the *Swedes* in the last century, and on their making a settlement, called *Helsingburg*, on the banks of the *Delaware*, somewhat below the place where *Salem* is now situated; they found, at the depth of twenty feet, some wells, inclosed with walls. This could not be a work of the native *Americans*, or *Indians*, as bricks were entirely unknown to them when the *Europeans* first settled here, at the end of the fifteenth century; and they still less knew how to make use of them. The wells were, at that time, on the land; but in such a place, on the banks of the *Delaware*, as is sometimes under water, and sometimes dry. But since, the ground has been so washed away, that the wells are entirely covered by the river, and the water is seldom low enough to shew the wells. As the *Swedes* afterwards made new wells for themselves, at some distance from the former, they discovered, in the ground, some broken earthen vessels, and some entire

good

December

good bricks ; and they have often got them out of the ground by ploughing.

From these marks, it seems, we may conclude, that in times of yore, either *Europeans* or other people of the then civilized parts of the world, have been carried hither by storms, or other accidents, settled here, on the banks of the river, burnt bricks, and made a colony here ; but that they afterwards mixed with the *Indians*, or were killed by them. They may gradually, by conversing with the *Indians*, have learnt their manners, and turn of thinking. The *Swedes* themselves are accused, that they were already half *Indians*, when the *English* arrived in the year 1682. And we still see, that the *French*, *English*, *Germans*, *Dutch*, and other *Europeans*, who have lived for several years together in distant provinces, near and among the *Indians*, grow so like them, in their behaviour and thoughts, that they can only be distinguished by the difference of their colour. But history, together with the tradition among the *Indians*, assures us, that the above-mentioned wells and bricks cannot have been made at the time of *Columbus's* expedition, nor soon after ; as the traditions of the *Indians* say, that those wells were made long before that epocha. This account of the wells, which had been
inclosed

inclosed with bricks, and of such bricks as have been found in several places in the ground, I have afterwards heard repeated by many other old *Swedes*.

December the 22d. AN old farmer foretold a change of the weather, because the air was very warm this day at noon, though the morning had been very cold. This he likewise concluded, from having observed the clouds gathering about the sun. The meteorological observations annexed to the end of this volume will prove that his observation was just.

December the 31st. THE remedies against the tooth-ach are almost as numerous as days in a year. There is hardly an old woman but can tell you three or four score of them, of which she is perfectly certain that they are as infallible and speedy in giving relief, as a month's fasting, by bread and water, is to a burthenome paunch. Yet it happens often, nay too frequently, that this painful disease eludes all this formidable army of remedies. However, I cannot forbear observing the following remedies, which have sometimes, in this country, been found effectual against the tooth-ach.

WHEN the pains come from the hollowness of the teeth, the following remedy is

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said to have had a good effect : A little cotton is put at the bottom of a tobacco-pipe ; the tobacco is put in upon it, and lighted ; and you smoke till it is almost burnt up. By smoking, the oil of the tobacco gets into the cotton, which is then taken out, and applied to the tooth as hot as it can be suffered.

THE chief remedy of the *Iroquois*, or *Iro-quesse*, against the tooth-ach occasioned by hollow teeth, I heard of Captain *Lindsey's* lady, at *Oswego* ; and she assured me, that she knew, from her own experience, that the remedy was effectual. They take the seed capsules of the *Virginian Anemone*, as soon as the seed is ripe, and rub them in pieces. It will then be rough, and look like cotton. This cotton-like substance is dipped into strong brandy, and then put into the hollow tooth, which commonly ceases to ache soon after. The brandy is biting or sharp, and the seeds of the anemone, as most seeds of the *Polyandria Polygynia* class of plants (or such as have many *Stamina*, or male flowers, and many *Pistilla*, or female flowers) have likewise an acrimony. They therefore, both together, help to assuage the pain ; and this remedy is much of the same kind with the former. Besides that, we have many seeds which

which have the same qualities with the *American* anemone.

THE following remedy was much in vogue against the tooth-ach which is attended with a swelling : They boil gruel, of flour of maize, and milk ; to this they add, whilst it is yet over the fire, some of the fat of hogs, or other suet, and stir it well, that every thing may mix equally. A handkerchief is then spread over the gruel, and applied as hot as possible to the swelled cheek, where it is kept till it is gone cool again. I have found, that this remedy has been very efficacious against a swelling ; as it lessens the pain, abates the swelling, opens a gathering, if there be any, and procures a good discharge of the Pus.

I HAVE seen the *Iroquese* boil the inner bark of the *Sambucus Canadensis*, or *Canada Elder*, and put it on that part of the cheek in which the pain was most violent. This, I am told, often diminishes the pain.

AMONG the *Iroquese*, or *Five Nations*, upon the river *Mohawk*, I saw a young *Indian* woman, who, by frequent drinking of tea, had got a violent tooth-ach. To cure it, she boiled the *Myrica asplenii folia*, and tied it, as hot as she could bear it, on the whole cheek. She said, that

remedy had often cured the tooth-ach before.

January the 2d, 1749. BEFORE the *Europeans* under the direction of *Columbus*, came to the *West-Indies*, the *savages* or *Indians* (who lived there since times immemorial) were entirely unacquainted with iron, which appears very strange to us, as *North America*, almost in every part of it, contains a number of iron mines. They were therefore obliged to supply this want with sharp stones, shells, claws of birds and wild beasts, pieces of bones, and other things of that kind, whenever they intended to make hatchets, knives, and such like instruments. From hence it appears, that they must have led a very wretched life. The old *Swedes* who lived here, and had had an intercourse with the *Indians* when they were young, and at a time when they were yet very numerous in these parts, could tell a great many things concerning their manner of living. At this time the people find accidentally, by ploughing and digging in the ground, several of the instruments which the *Indians* employed, before the *Swedes* and other *Europeans* had provided them with iron tools. For it is observable that the *Indians* at present make use of no other tools, than such as are made of iron and other metals, and

and which they always get from the *Euro-
peans*: Of this I shall be more particular,
in its proper place. But having had an op-
portunity of seeing, and partly collecting a
great many of the ancient *Indian* tools, I
shall here describe them.

THEIR *batchets* were made of stone.
Their shape is similar to that of the wedges
with which we cleave our wood, about half
a foot long, and broad in proportion; they
are made like a wedge, sharp at one end,
but rather blunter than our wedges. As
this hatchet must be fixed on a handle, there
was a notch made all round the thick end.
To fasten it, they split a stick at one end, and
put the stone between it, so that the two
halves of the stick come into the notches of
the stone; then they tied the two split ends
together with a rope or something like it,
almost in the same way as smiths fasten the
instrument with which they cut off iron,
to a split stick. Some of these stone-hatchets
were not notched or furrowed at the upper
end, and it seems they only held those in
their hands in order to hew or strike with
them, and did not make handles to them.
Most of the hatchets which I have seen,
consisted of a hard rock-stone: but some
were made of a fine, hard, black, apyrous
stone. When the *Indians* intended to fell

a thick strong tree, they could not make use of their hatchets, but for want of proper instruments employed fire. They set fire to a great quantity of wood at the roots of the tree, and made it fall by that means. But that the fire might not reach higher than they would have it, they fastened some rags to a pole, dipped them into water, and kept continually washing the tree, a little above the fire. Whenever they intended to hollow out a thick tree for a canoe, they laid dry branches all along the stem of the tree, as far as it must be hollowed out. They then put fire to those dry branches, and as soon as they were burnt, they were replaced by others. Whilst these branches were burning, the *Indians* were very busy with wet rags, and pouring water upon the tree, to prevent the fire from spreading too far on the sides and at the ends. The tree being burnt hollow as far as they found it sufficient, or as far as it could without damaging the canoe, they took the above described stone-hatchets, or sharp flints, and quartzes, or sharp shells, and scraped off the burnt part of the wood, and smoothened the boats within. By this means they likewise gave it what shape they pleased. Instead of cutting with a hatchet such a piece of wood as was necessary for making
a canoe,

a canoe, they likewise employed fire. A canoe was commonly between thirty and forty feet long. The chief use of their hatchets was, according to the unanimous accounts of all the *Swedes*, to make good fields for maize-plantations; for if the ground where they intended to make a maize-field was covered with trees, they cut off the bark all round the trees with their hatchets, especially at the time when they lose their sap. By that means the tree became dry, and could not take any more nourishment, and the leaves could no longer obstruct the rays of the sun from passing. The smaller trees were then pulled out by main force, and the ground was a little turned up with crooked or sharp branches.

INSTEAD of *knives* they were satisfied with little sharp pieces of flint or quartz, or else some other hard kind of a stone, or with a sharp shell, or with a piece of a bone which they had sharpened.

AT the end of their *arrows* they fastened narrow angulated pieces of stone; they made use of them, having no iron to make them sharp again, or a wood of sufficient hardness: these points were commonly flints or quartzes, but sometimes likewise another kind of a stone. Some employed the bones of animals, or the

claws of birds and beasts. Some of these ancient harpoons are very blunt, and it seems that the *Indians* might kill birds and small quadrupeds with them; but whether they could enter deep into the body of a great beast or of a man, by the velocity which they get from the bow, I cannot ascertain; yet some have been found very sharp and well made.

THEY had *stone pestles*, about a foot long, and as thick as a man's arm. They consist chiefly of a black sort of a stone, and were formerly employed, by the *Indians*, for pounding maize, which has, since times immemorial, been their chief and almost their only corn. They had neither wind-mills, water-mills, nor hand-mills, to grind it, and did not so much as know a mill, before the *Europeans* came into the country. I have spoken with old *Frenchmen*, in *Canada*, who told me, that the *Indians* had been astonished beyond expression, when the *French* set up the first wind-mill. They came in numbers, even from the most distant parts, to view this wonder, and were not tired with sitting near it for several days together, in order to observe it; they were long of opinion that it was not driven by the wind, but by the spirits who lived within it. They were partly
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under the same astonishment when the first water-mill was built. They formerly pounded all their corn or maize in hollow trees, with the above-mentioned pestles, made of stone. Many *Indians* had only wooden pestles. The blackish stone, of which the hatchets and pestles are sometimes made, is very good for a grindstone, and therefore both the *English* and the *Swedes* employ the hatchets and pestles chiefly as grindstones, at present, when they can get them.

THE old boilers or kettles of the *Indians*, were either made of clay, or of different kinds of pot-stone, (*Lapis ollaris*). The former consisted of a dark clay, mixt with grains of white sand or quartz, and burnt in the fire. Many of these kettles have two holes in the upper margin, on each side one, through which the *Indians* put a stick, and held the kettle over the fire, as long as it was to boil. Most of the kettles have no feet. It is remarkable that no pots of this kind have been found glazed, either on the outside or the inside. A few of the oldest *Swedes* could yet remember seeing the *Indians* boil their meat in these pots. They are very thin, and of different sizes; they are made sometimes of a greenish, and sometimes of a grey

grey pot-stone, and some are made of another species of apyrous stone; the bottom and the margin are frequently above an inch thick. The *Indians*, notwithstanding their being unacquainted with iron, steel, and other metals, have learnt to hollow out very ingeniously these pots or kettles of pot-stone.

THE old *tobacco-pipes* of the *Indians* are likewise made of clay, or pot-stone, or serpentine-stone. The first sort are shaped like our tobacco-pipes, though much coarser and not so well made. The tube is thick and short, hardly an inch long, but sometimes as long as a finger; their colour comes nearest to that of our tobacco-pipes which have been long used. Their tobacco-pipes of pot-stone are made of the same stone as their kettles. Some of them are pretty well made, though they had neither iron nor steel. But besides these kinds of tobacco-pipes, we find another sort of pipes, which are made with great ingenuity, of a very fine, red pot-stone, or a kind of serpentine marble. They are very scarce, and seldom made use of by any other than the *Indian Sachems*, or elders. The fine red stone, of which these pipes are made, is likewise very scarce, and is found only in the country of those

Indians who are called *Ingouez*, and who, according to father *Charlevoix*, live on the other side of the river *Mississippi* *. The *Indians* themselves commonly value a pipe of this kind as much as a piece of silver of the same size, and sometimes they make it still dearer. Of the same kind of stone commonly consists their *pipe of peace*, which the *French* call *calumet de paix*, and which they make use of in their treaties of peace, and alliances. Most authors who have wrote of these nations mention this instrument, and I intend to speak of it when an opportunity offers.

THE *Indians* employ hooks made of bone, or bird's claws, instead of *fishing-hooks*. Some of the oldest *Swedes* here told me, that when they were young, a great number of *Indians* had been in this part of the country, which was then called *New Sweden*, and had caught fishes in the river *Delaware*, with these hooks.

THEY made fire by rubbing one end of a hard piece of wood continually against another dry one, till the wood began to smoke, and afterwards to burn.

SUCH were the tools of the antient *Indians*, and the use which they made of them,

* See his *Journal historique d'un voyage de l'Amerique*. Tome v. p. m. 311. and the 13th letter,

them, before the *Europeans* invaded this country, and before they (the *Indians*) were acquainted with the advantages of iron. *North America* abounds in iron-mines, and the *Indians* lived all about the country before the arrival of the *Europeans*, so that several places can be shewn in this country, where at present there are iron-mines, and where, not a hundred years ago, stood great towns or villages of the *Indians*. It is therefore very remarkable that the *Indians* did not know how to make use of a metal or ore which was always under their eyes, and on which they could not avoid treading every day. They even lived upon the very spots where iron ores were afterwards found, and yet they often went many miles in order to get a wretched hatchet, knife, or the like, as above described. They were forced to employ several days in order to sharpen their tools, by rubbing them against a rock, or other stones, though the advantage was far from being equal to the labour. For they could never cut down a thick tree with their hatchets, and with difficulty they felled a small one. They could not hollow out a tree with their hatchets, or do a hundredth part of the work which we can perform with ease, by the help of our iron hatchets.

hatchets. Thus we see how disadvantageous the ignorance and inconsiderate contempt of useful arts is. Happy is the country which knows their full value!

January the 5th. CHRISTMAS-DAY was celebrated this day by the *Swedes* and *English*, for they kept then to the *old stile*.

January the 6th. THERE are a great number of hares in this country, but they differ from our *Swedish* ones in their size, which is very small, and but little bigger than that of a rabbit; they keep almost the same grey colour both in summer and winter, which our *Northern* hares have in summer only; the tip of their ears is always grey, and not black; the tail is likewise grey on the upper side, at all seasons; they breed several times a year: in spring they lodge their young ones in hollow trees, and in summer, in the months of *June* and *July*, they breed in the grass. When they are surprised they commonly take refuge in hollow trees, out of which they are taken by means of a crooked stick, or by cutting a hole into the tree, opposite to the place where they lie; or by smoke, which is occasioned by making a fire on the outside of the tree. On all these occasions the greyhounds must be at hand. These hares never bite, and can be touched without any danger. In day-time they usually

usually lie in hollow trees, and hardly ever stir from thence, unless they be disturbed by men or dogs; but in the night they come out, and seek their food. In bad weather, or when it snows, they lie close for a day or two, and do not venture to leave their retreats. They do a great deal of mischief in the cabbage-fields; but apple-trees suffer infinitely more from them, for they peel off all the bark next to the ground. The people here agreed that the hares are fatter in a cold and severe winter, than in a mild and wet one, of which they could give me several reasons, from their own conjectures. The skin is useless, because it is so loose, that it can be drawn off; for when you would separate it from the flesh, you need only pull at the fur, and the skin follows: these hares cannot be tamed. They were at all times, even in the midst of winter, plagued with a number of common fleas*.

January the 16th. THE common mice were in great abundance in the towns and in the country; they do as much mischief as in the old countries. *Oldmixon* in his book,

* This account sufficiently proves, that these hares are a species distinct from our *European* reddish grey kind, and also of that species or *variety* only, which in the northern parts of *Europe* and *Asia* is white in winter, with black tipped ears, and has a grey coat in summer. Upon a closer examination naturalists will perhaps find more characters to distinguish them more accurately. F.

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book, the *British Empire in America*, vol. i. p. 444, writes, that *North America* had neither rats nor mice before *European* ships brought them over. How far this is true I know not. It is undoubted, that in several desert places, where no man ever lived, I have seen and killed the common mice, in crevices of stones or mountains; and is it probable that all such mice as are spread in this manner, throughout the inland parts of the country, derive their origin from those which were brought over from *Europe*?

RATS likewise may be ranked among those animals which do great damage in this country. They live both in the cities and in the country, and destroy the provisions. Their size is the same with that of our rats, but their colour differs; for they are grey, or blue-grey. I enquired of the *Swedes*, Whether these rats had been here prior to the arrival of the *Europeans*, or whether they came over in the ships? But I could not get an answer which I might depend upon. All agreed, that a number of these dangerous and mischievous animals were every year brought to *America*, by ships from *Europe* and other countries. But Mr. *Bartram* maintained, that before the *Europeans* settled here, rats had been in the country; for he saw a great number of them on the high mountains,

tains, which are commonly called the *Blue Mountains*, where they lived among stones, and in the subterraneous grottoes which are in those mountains. They always lie very close in the day-time, and you hardly ever see one out; but at night they come out, and make a terrible noise. When the cold was very violent, they seemed quite torpid; for during the continuance of the cold weather, one could not hear the least noise, or shrieking, occasioned by them. It is to be observed, that neither the *Swedes* nor the *English* have any dark windows in their houses here. There is hardly a dormer-window in the garret; but only loose boards. The walls in the wooden houses are frequently not closed, even with moss; so that the rooms, though they have fires in them, are no warmer than the outside apartment, or hall. The rooms where the servants sleep have never any fire in them, though the winter is pretty severe sometimes. The rats have, therefore, little or no warmth in winter; but as soon as a milder season makes its appearance, they come out again. We observed several times this winter, that the rats were very active, and made an unusual noise all night, just before a severe cold. It seems, they had some sensation of cold weather being at hand; and that they therefore eat sufficiently, or stored up

up provisions. In mild weather, they were used to carry away apples, and other provisions : therefore, we could always conclude, with certainty, when the rats made an uncommon noise at night, or were extremely greedy, that a severe cold would ensue. I have already observed in the preceding volume, p. 312, that the grey squirrels in this country have the same quality. When these, and the common mice, eat maize, they do not consume the whole grains, but only the loose, sweet and soft kernel, and leave the rest.

January the 21st. THE cold now equalled that of *Sweden*, though this country is so much more southerly. The *Celsian* or *Swedish* thermometer was twenty-two degrees below the freezing point, in the morning. As the rooms are without any shutters here, the cracks in the walls not closed with moss, and sometimes no fire-place or chimney in the room, the winters here must be very disagreeable to one who is used to our *Swedish* warm winter-rooms. But the greatest comfort here is, that the cold is of a very short duration. Some days of this month, the room which I lodged in was such, that I could not write two lines before the ink would freeze in my pen. When I did not write, I could not leave the ink-stand on the

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table ;

table ; but was forced to put it upon the hearth, or into my pocket. Yet, notwithstanding it was so cold, as appears from the meteorological observations at the end of this volume, and though it snowed sometimes for several days and nights together, and the snow lay near six inches high upon the ground, yet all the cattle are obliged to stay, day and night, in the fields, during the whole winter. For neither the *English* nor the *Swedes* had any stables ; but the *Germans* and *Dutch* had preserved the custom of their country, and generally kept their cattle in stables during winter. Almost all the old *Swedes* say, that on their first arrival in this country, they made stables for their cattle, as is usual in *Sweden* ; but as the *English* came, and settled among them, and left their cattle in the fields all winter, as is customary in *England*, they left off their former custom, and adopted the *English* one. They owned, however, that the cattle suffered greatly in winter, when it was very cold, especially when it froze after a rain ; and that some cattle were killed by it in several places, in the long winter of the year 1741. About noon, the cattle went out into the woods, where there were yet some leaves on the young oak ; but they did not eat the leaves, and only bit off the extremities of the
5 branches,

branches, and the tops of the youngest oaks. The horses went into the maize fields, and ate the dry leaves on the few stalks which remained. The sheep ran about the woods, and on the corn fields. The chickens perched on the trees of the gardens, at night; for they had no particular habitations. The hogs were likewise exposed to the roughness of the weather, within a small inclosure.

A SMALL kind of birds, which the *Swedes* call *Snow-bird*, and the *English* *Chuck-bird*, came into the houses about this time. At other times, they sought their food along the roads. They are seldom seen, but when it snows. *Catesby*, in his *Natural History of Carolina*, calls it *Passer nivalis*; and Dr. *Linnæus*, in his *Systema Naturæ*, calls it *Emberiza lyemalis*.

THE river *Delaware* was now covered with ice opposite *Philadelphia*, and even somewhat lower, and the people could walk over it; but nobody ventured to ride over on horseback.

January the 22d. THERE are partridges in this country; but they are not of the same kind with ours. The *Swedes* called them sometimes *rapphons* (partridges), and sometimes *aekkerboens* (quails). Some of the *English* likewise called them partridges,

others quails. Their shape is almost the same with that of the *European* partridges, and their nature and qualities the same : I mean, they run and hide themselves, when pursued. But they are smaller, and entirely different in colour. In this work I cannot insert, at large, the descriptions which I have made of birds, insects, quadrupeds, and plants ; because it would swell my volume too much. I only observe, that the feet are naked, and not hairy ; the back is spotted with brown, black, and white ; the breast is dark yellow ; and the belly whitish, with black edges on the tips of the feathers. The size is nearly that of a hazel-hen, or *tetrao bonasia*. Above each eye is a narrow stroke of whitish yellow. These birds are numerous in *New Sweden*, i. e. this part of the country. On going but a little way, you meet with great coveys of them. However, they keep at a great distance from towns ; being either extirpated, or frightened there by the frequent shooting. They are always in lesser or greater coveys, do not fly very much, but run in the fields, and keep under the bushes and near the inclosures, where they seek their food. They are reckoned very delicious food ; and the people here prepare them in different ways. For that purpose they are caught, and shot in

in great numbers. They are caught by putting up a sieve, or a square open box, made of boards, in the places they frequent. The people strew some oats under the sieve, and lift it up on one side by a little stick; and as soon as the partridges are got under the sieve, in order to pick up the oats, it falls, and they are caught alive. Sometimes they get several partridges at once. When they run in the bushes, you can come very near them, without starting them. When they sleep at night, they come together in an heap. They scratch in the bushes and upon the field, like common chickens. In spring they make their nests, either under a bush or in the maize fields, or on the hills in the open air: they scratch some hay together, into which they lay about thirteen white eggs. They eat several sorts of corn, and seeds of grass. They have likewise been seen eating the berries of *sumach*, or *rubus glabra*. Some people have taken them young, and kept them in a cage till they were tame: then they let them go; and they followed the chickens, and never left the court-yards.

THE inclosures made use of in *Pennsylvania* and *New Jersey*, but especially in *New York*, are those, which on account of their serpentine form resembling worms, are called

worm-fences in *English*. The poles which compose this fence are taken from different trees ; but they are not all of equal duration : the red *cedar* is reckoned the most durable of any, for it holds out above thirty years ; but it is very scarce, and grows only in a single place hereabouts, so that no fences can be made of it. It is true, the fences about *Philadelphia* (which however are different from the *worm-fences*) are all made of red *cedar* ; but it has been brought by water from *Egg-harbour*, where it grows in abundance. The supports on which the poles lie are made of the white *cedar*, or *Cupressus thyoides*, and the poles which are laid between them of the red *cedar* or *Juniperus Virginiana*. Next to the *cedar-wood*, *oak* and *chestnut* are reckoned best. *Chestnut* is commonly preferred, but it is not every where so plentiful as to be made into fences ; in its stead they make use of several sorts of *oak*. In order to make inclosures, the people do not cut down the young trees, as is common with us, but they fell here and there thick trees, cut them in several places, leaving the pieces as long as it is necessary, and split them into poles of the usual thickness ; a single tree affords a multitude of poles. Several old men in this country told me, that the *Swedes* on their arrival here, made

made such inclosures as are usual in *Sweden*, but they were forced to leave off in a few years time, because they could not get posts enough; for they had found by experience that a post being put into the ground would not last above four or six years before the part under ground was entirely rotten; but the chief thing was, that they could not get any switches for to tie them together; they made some of *hiccory*, which is one of the toughest trees in this country, and of the white *oak*; but in the space of a year or two the switches were rotten, and the fence fell in pieces of itself, therefore they were forced to give over making such inclosures. Several of the new comers again attempted, but with the same bad success, to make fences with posts and switches. The *Swedish* way of inclosing therefore will not succeed here. Thus the *worm-fences* are one of the most useful sorts of inclosures, especially as they cannot get any post, made of the woods of this country, to stay above six or eight years in the ground without rotting. The poles in this country are very heavy, and the posts cannot bear them well, especially when it blows a storm; but the *worm-fences* are easily put up again, when they are thrown down. Experience has

shewn that an inclosure made of *chestnut* or white *oak* seldom holds out above ten or twelve years, before the poles and posts are thoroughly rotten: when the poles are made of other wood, the fences hardly stand six or eight years. Considering how much more wood the *worm-fences* require, (since they run in bendings) than other inclosures which go in strait lines, and that they are so soon useless, one may imagine how the forests will be consumed, and what sort of an appearance the country will have forty or fifty years hence, in case no alteration is made; especially as wood is really squandered away in immense quantities, day and night all the winter, or nearly one half of the year, for fuel.

February the 8th. THE *Musk-rats*, so called by the *English* in this country, on account of their scent, are pretty common in *North America*; they always live near the water, especially on the banks of lakes, rivers, and brooks. On travelling to places where they are, you see the holes which they have dug in the ground just at the water's edge, or a little above its surface. In these holes they have their nests, and there they continue whenever they are not in the water in pursuit of food. The *Swedes* call

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them *Désinans Rattor* *, and the *French, Rats musqués*. *Linnaeus* calls this animal *Castor Zibethicus*. Their food is chiefly the muscles which ly at the bottom of lakes and rivers ; you see a number of such shells near the entrance of their holes. I am told they likewise eat several kinds of roots and plants. They differ from the *European Musk-rat*, or *Linnaeus's Castor Moschatus*. The teeth are the same in both ; the tail of the *American* is compressed on the sides so, that one sharp edge goes upwards and the other downwards : the hind feet are not palmated, or joined by a moveable skin, but are peculiar for having on both sides of the feet, long, white, close, pectinated, off-standing hair, besides the short hair with which the feet are quite covered. Such hairs are on both sides of the toes, and do the same service in swimming as a web. Their size is that of a little cat, or to be more accurate, the length of the body is about ten inches, and the tail of the same length : the colour of the head, neck, back, sides, and of the outside of the thighs, is blackish brown ; the hairs are soft and shin-

* *Désm* signifies *musk* in the *Swedish*, and in some provincial dialects of the *German* language ; consequently *Désmán-rat* is nothing but *Musk-rat*, and from hence Mr. *de Buffon* has formed his *Désmán* or *Russian Musk-rat*. F.

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ing; under the neck, on the breasts, and on the inside of the thighs, they are grey. They make their nests in the dykes that are erected along the banks of rivers to keep off the water from the adjoining meadows; but they often do a great deal of damage, by spoiling the dykes with digging, and opening passages for the water to come into the meadows; whereas *Beavers* stop up all the holes in a dyke or bank. They make their nests of twigs and such like things externally, and carry soft stuff into them for their young ones to ly upon. The *Swedes* asserted that they could never observe a diminution in their number, but believed that they were as numerous at present as formerly. As they damage the banks so considerably, the people are endeavouring to extirpate them, when they can find out their nests; the skin is paid for, and this is an encouragement towards catching the animal. A skin of a *Musk-rat* formerly cost but three-pence, but at present they gave from six-pence to nine-pence. The skins are chiefly employed by hatters, who make hats of the hair, which are said to be nearly as good as *Beaver* hats. The *Musk-rats* are commonly caught in traps, with apples as baits. In the country of the *Iroquese*, I saw those *Indians* following the
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holes of the *Musk-rats* by digging till they came to their nests, where they killed them all. Nobody here eats their flesh; I do not know whether the *Indians* eat it, for they are commonly not over nice in the choice of meat. The musk-bag is put between the cloaths in order to preserve them against worms. It is very difficult to extirpate these *Rats* when they are once settled in a bank. A *Swede*, however, told me, that he had freed his bank, or piece of dyke along the river, from them in the following manner: He sought for all their holes, stopped them all up with earth, excepting one, on that side from whence the wind came. He put a quantity of sulphur into the open entrance, set fire to it, and then closed the hole, leaving but a small one for the wind to pass through. The smoke of the sulphur then entered their most remote nests, and stifled all the animals. As soon as the sulphur was burnt, he was obliged to dig up part of the ground in the bank, where they had their nests; and he found them lie dead by heaps. He sold the skins, and they paid his trouble, not to mention the advantage he got by clearing his bank of the *Musk-rats*.

BEAVERS were formerly abundant in *New Sweden*, as all the old *Swedes* here told

told me. At that time they saw one bank after another raised in the rivers by beavers. But after the *Europeans* came over in great number, and cultivated the country better, the beavers have been partly killed, and partly extirpated, and partly are removed higher into the country, where the people are not so numerous. Therefore there is but a single place in *Pensylvania* where beavers are to be met with; their chief food is the bark of the beaver-tree, or *Magnolia glauca*, which they prefer to any other. The *Swedes* therefore put branches of this tree near the beaver-dykes, into traps, which they laid for the beavers, whilst they were yet plentiful; and they could almost be certain of good success. Some persons in *Philadelphia* have tamed beavers, so that they go a fishing with them, and they always come back to their masters. Major *Roderfert*, in *New York*, related that he had a tame beaver above half a year in his house, where he went about quite loose, like a dog. The major gave him bread, and sometimes fish, which he was very greedy of. He got as much water in a bowl as he wanted. All the rags and soft things he could meet with he dragged into a corner, where he was used to sleep, and made a bed of them. The

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cat in the house, having kittens, took possession of his bed, and he did not hinder her. When the cat went out, the beaver often took the kitten between his fore paws and held it to his breast to warm it, and doated upon it; as soon as the cat returned he gave her the kitten again. Sometimes he grumbled, but never did any hurt, or attempted to bite.

THE *English* and the *Swedes* gave the name of *Mink* to an animal of this country, which likewise lives either in the water, or very near it. I have never had an opportunity to see any more than the skin of this animal. But the shape of the skin, and the unanimous accounts I have heard of it, make me conclude with much certainty, that it belonged to the genus of *weasels* or *mustelæ*. The greatest skin I ever saw, was one foot, eight inches long, a lesser one was about ten inches long, and about three inches, one third broad, before it was cut; the colour was dark brown, and sometimes almost black; the tail was bushy, as that of a marten; the hair was very close; and the ears short, with short hair. The length of the feet belonging to the lesser skin was about two inches long. I am told this animal is so similar to the *American polecat*, or *Viverra putorius*,

rius, that they are hardly distinguishable *. I have had the following accounts given me of its way of living; it seldom appears in day-time, but at night it comes out of the hollow trees, on the banks of rivers. Sometimes it lives in the docks and bridges, at *Philadelphia*, where it is a cruel enemy to the rats. Sometimes it gets into the court-yards at night, and creeps into the chicken-house, through a small hole, where it kills all the poultry, and sucks their blood, but seldom eats one. If it meets with geese, fowls, ducks, or other birds on the road, it kills and devours them. It lives upon fish and birds. When a brook is near the houses, it is not easy to keep ducks and geese, for the *mink*, which lives near rivers, kills the young ones. It first kills as many as it can come at, and then it carries them off, and feasts upon them. In banks and dykes near the water, it likewise does mischief, with digging. To catch it the people put up traps, into which they put heads of birds, fishes, or other meat. The skin is sold in the towns, and at *Philadelphia*; they give twenty-pence and even two shillings a-piece for them, according

* The *Mink*, or *Minx*, is a kind of small otter, which is called by Dr. *Linnaeus*, *Musſela lutreola*, in his *system*. i. p. 66. F.

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according to their size. Some of the ladies get muffs made of these skins; but for the greatest part they are sent over to *England*, from whence they are distributed to other countries. The old *Swedes* told me that the *Indians* formerly used to eat all kinds of flesh, except that of the *mink*.

I have already mentioned something of the *Raccoon*; I shall here add more of the nature of this animal, in a place which is properly its native country *. The *English* call it every where by the name of *Raccoon*, which name they have undoubtedly taken from one of the *Indian* nations; the *Dutch* call it *Hespan*, the *Swedes*, *Esplan*, and the *Iroquese*, *Attigbro*. It commonly lodges in hollow trees, lies close in the day-time, never going out but on a dark, cloudy day; but at night it rambles and seeks its food. I have been told by several people, that in bad weather, especially when it snows and blows a storm, the *Raccoon* lies in its hole for a week together without coming out once; during that time it lives by sucking and licking its paws. Its food are several sorts of fruit, such as maize, whilst the ears are soft. In gardens it often does a great deal of damage among the apples, chestnuts, plumbs, and wild

* The village of *Raccoon*.

wild grapes, which are what it likes best ; among the poultry it is very cruel. When it finds the hens on their eggs, it first kills them, and then eats the eggs. It is caught by dogs, which trace it back to its nest, in hollow trees, or by snares and traps, in which a chicken, some other bird, or a fish, is put as a bait. Some people eat its flesh. It leaps with all its feet at once ; on account of this and of several other qualities, many people here reckoned it to the genus of bears. The skin sold for eighteenpence, at *Philadelphia*. I was told that the *Raccoons* were not near so numerous as they were formerly ; yet in the more inland parts they were abundant. I have mentioned the use which the hatters make of their furs ; as likewise that they are easily tamed, that they are very greedy of sweet-meats, &c. in the preceding volume. Of all the *North American* wild quadrupeds none can be tamed to such a degree as this.

February the 10th. In the morning I went to *Philadelphia*, where I arrived towards night. On my arrival at the ferry upon the river *Delaware*, I found the river quite covered with drifts of ice, which at first prevented our crossing the water. After waiting about an hour, and making an opening near the ferry, I, together with
many

many more passengers, got over, before any more shoals came on. As it began to freeze very hard soon after the twelfth of *January* (or *New Year*, according to the old style) the river *Delaware* was covered with ice, which by the intenseness of the frost grew so strong, that the people crossed the river with horses at *Philadelphia*. The ice continued till the eighth of *February*, when it began to get loose, and the violent hurricane, which happened that night, broke it, and it was driven down so fast, that on the twelfth of *February* not a single shoal came down, excepting a piece or two near the shore.

CROWS flew in great numbers together to-day, and settled on the tops of trees. During the whole winter we hardly observed one, though they are said to winter there. During all this spring they commonly used to sit at the tops of trees in the morning; yet not all together, but in several trees. They belong to the noxious birds in this part of the world, for they chiefly live upon corn. After the maize is planted or sown, they scratch the grains out of the ground and eat them. When the maize begins to ripen, they peck a hole into the involucre which surrounds the ear, by which means the maize is spoiled, as the rain passes

through the hole which they have made, and occasions the putrefaction of the corn. Besides eating corn, they likewise steal chickens. They are very fond of dead carcasses. Some years ago the government of *Pensylvania* had given three-pence, and that of *New Jersey* four-pence premium for every head of a *Crow*, but this law has now been repealed, as the expences are too great. I have seen the young *Crows* of this kind in several places playing with tame ones whose wings were cut. The latter hopped about the fields, near the farm-houses where they belonged to, but always returned again, without endeavouring to escape on any occasion. These *American Crows* are only a variety of the *Royston Crow*, or *Linnaeus's Corvus Cornix*.

February the 12th. In the afternoon I returned to *Raccoon* from *Philadelphia*.

ON my journey to *Raccoon*, I attentively observed the trees which had yet any leaves left. The leaves were pale and dried up, but not all dropt from the following trees :

THE *Beach-tree*, (*Fagus sylvatica*) whether great or small ; it always kept a considerable part of its leaves during the whole winter even till spring. The greater trees kept the lowermost leaves.

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THE *white oak* (*Quercus alba*). Most of the young trees which were not above a quarter of a yard in diameter, had the greatest part of their leaves still on them, but the old trees had lost most of theirs, except in some places where they have got new shoots. The colour of the dry leaves was much paler in the white oak than in the black one.

THE *black oak* (as it is commonly called here). Dr. *Linnaeus* calls it the red oak, *Quercus rubra*. Most of the young trees still preserved their dried leaves. Their colour was reddish brown, and darker than that of the white oak.

THE *Spanish oak*, which is a mere variety of the black oak. The young trees of this kind likewise keep their leaves.

A SCARCE *species of oak* which is known by its leaves having a triangular *apex* or top, whose angles terminate in a short bristle; the leaves are smooth below, but woolly above*. The young oaks of this species had still their leaves.

When I came into any wood where the above kinds of oaks were only twenty years, and even not so old, I always found the leaves on them.

* This seems to be nothing but a variety of the *Quercus rubra*. Linn. F.

It seems that Providence has, besides other views, aimed to protect several sorts of birds, it being very cold and stormy about this time, by preserving even the dry leaves on these trees. I have this winter at several times seen birds hiding in the trees covered with old leaves during a severe cold or storm.

February the 13th. As I began to dig a hole to-day, I found several insects which were crept deep into the ground in order to pass the winter. As soon as they came to the air, they moved their limbs a little, but had not strength sufficient for creeping, except the black ants, which crept a little, though slowly.

FORMICA nigra, or *the black ant*, were pretty numerous, and somewhat lively. They lay about ten inches below the surface.

CARABUS latus. Some of these lay at the same depth with the ants. This is a very common insect in all *North America*.

SCARABÆUS; chestnut-coloured, with a hairy thorax; the elytræ shorter than the abdomen, with several longitudinal lines, beset with hair. It is something similar to the *cock-chaffer*, but differs in many respects. I found it very abundant in the ground.

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GRYLLUS campestris, or the field-cricket: They lay ten inches deep; they were quite torpid, but as soon as they came into a warm place they revived and were quite lively. In summer I have found these crickets in great plenty in all parts of *North America* where I have been. They leaped about on the fields, and made a noise like that of our common house-crickets, so that it would be difficult to distinguish them by their chirping. They sometimes make so great a noise, that it causes pain in the ears, and even two people cannot understand each other. In such places where the rattlesnakes live, the field-crickets are very disagreeable, and in a manner dangerous, for their violent chirping prevents the warning, which that horrid snake gives with its rattle, from reaching the ear, and thus deprives one of the means of avoiding it. I have already mentioned that they likewise winter sometimes in chimnies*. Here they ly all winter in the ground, but at the beginning of *March*, as the air was grown warm, they came out of their holes, and began their music, though at first it was but very faint and rarely heard. When we were forced on our travels to sleep in uninhabited places, the crickets had got into the folds of our

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clothes,

* See page 10.

clothes, so that we were obliged to stop an hour every morning in examining our clothes, before we could get rid of them.

THE red ants (*Formica rufa*) which in Sweden make the great ant-hills, I likewise found to-day and the following day; they were not in the ground, for when my servant *Yungstroem* cut down old dry trees, he met with a number of them in the cracks of the tree. These cracks were at the height of many yards in the tree, and the ants were crept so high, in order to find their winter habitation: As soon as they came into a warm place, they began to stir about very briskly.

February the 14th. THE Swedes and the English gave the name of *blue bird* to a very pretty little bird, which was of a fine blue colour. *Linnæus* calls it *Motacilla Sialis*. *Catesby* has drawn it in his *Natural history of Carolina*, vol. I. pl. 47, and described it by the name of *Rubecula Americana cærulea*; and *Edwards* has represented it in his *Natural history of birds*, plate and page 24. In my own journal I called it *Motacilla cærulea nitida, pectore rufo, ventre albo*. In *Catesby's* plate I must observe, that the colour of the breast ought to be dirty red or ferruginous; the tibiae and feet black as jet; the bill too should be quite black; the blue colour in
general

general ought to be much deeper, more lively and shining; no bird in *Sweden* has so shining and deep a blue colour as this: The jay has perhaps a plumage like it. The food of the blue bird is not merely insects, he likewise feeds upon plants; therefore in winter, when no insects are to be met with, they come to the farm-houses in order to subsist on the seeds of hay, and other small grains.

RED-bird is another species of small bird. *Catesby* has likewise figured it*. Dr. *Linnaeus* calls it, *Loxia Cardinalis*. It belongs to that class of birds which are enemies to bees, lying in wait for them and eating them. I fed a cock for five months together in a cage; it eat both maize and buckwheat, for I gave it nothing else. By its song it attracted others of its species to the court-yard, and after we had put some maize on the ground under the window where I had it, the others came there every day to get their food; it was then easy to catch them by means of traps. Some of them, especially old ones, both cocks and hens, would die with grief on being put into cages. Those on the other hand which were grown tame, began to sing exceedingly

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sweet:

* See *Catesby's Natural history*, vol. I. pl. 38. *Coccothraustes rubra*.

sweet. Their note very nearly resembles that of our *European* nightingale, and on account of their agreeable song, they are sent abundantly to *London*, in cages. They have such strength in their bill that when you hold your hand to them they pinch it so hard as to cause the blood to issue forth. In spring they sit warbling on the tops of the highest trees in the woods, in the morning. But in cages they sit quite still for an hour; the next hour they hop up and down, singing; and so they go on alternately all day.

February the 17th. CRANES (*Ardea Canadensis*) were sometimes seen flying in the day-time, to the northward. They commonly stop here early in spring, for a short time, but they do not make their nests here, for they proceed on more to the north. Certain old *Swedes* told me, that in their younger years, as the country was not yet much cultivated, an incredible number of cranes were here every spring; but at present they are not so numerous. Several people who have settled here, eat their flesh, when they can shoot them. They are said to do no harm to corn, or the like.

February the 23d. THIS morning I
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went down to *Penn's Neck*, and returned in the evening.

SNOW lay yet in several parts of the woods, especially where the trees stood very thick, and the sun could not make its way : however it was not above four inches deep. All along the roads was ice, especially in the woods, and therefore it was very difficult to ride horses, which were not sharp-shoed. The people who are settled here know little of sledges, but ride on horseback to church in winter, though the snow is sometimes near a foot deep. It lays seldom above a week before it melts, and then some fresh snow falls.

A species of birds, called by the *Swedes*, *maize-thieves*, do the greatest mischief in this country. They have given them that name, because they eat maize, both publicly and secretly, just after it is sown and covered with the ground, and when it is ripe. The *English* call them *blackbirds*. There are two species of them, both described and drawn by *Catesby* *. Though they are very different in species, yet there is

* See *Catesby's nat. hist. of Carolina*, vol. i. tab. 12. *The purple dawk*, and tab. 13. *the red-winged starling* : but as both these drawings are in a very expensive work, we have, from specimens lately brought over from *America*, made a new drawing, which represents them both, and it is engraved here, tab. I. F.

is so great a friendship between them, that they frequently accompany each other in mixed flocks. However, in *Pensylvania*, the first sort are more obvious, and often fly together, without any of the red-winged *stares*. The first sort, or the purple daws, bear, in many points, so great a likeness to the daw, the stare, and the thrush, that it is difficult to determine to which genus they are to be reckoned, but seem to come nearest to the stare; for the bill is exactly the same with that of the thrush, but the tongue, the flight, their sitting on the trees, their song and shape, make it entirely a stare; at a distance they look almost black, but close by they have a very blue or purple cast, but not so much as *Catesby's* print: their size is that of a stare; the bill is conic, almost subulated, strait, convex, naked at the base, black, with almost equal mandibles, the upper being only a very little longer than the lower; the nostrils are oblong, yet a little angulated, so as to form almost squares; they are placed obliquely at the base of the bill, and have no hair; there is a little horny knob, or a small prominence on the upper side of them; the tongue is sharp and bifid at the point; the iris of the eyes is pale; the forehead, the crown, the nucha, the

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the upper part and the sides of the neck are of an obscure blue and green shining colour; the sides of the head under the eyes are obscurely blue; all the back and coverts of the wings are purple; the upper coverts of the tail are not of so conspicuous a purple colour, but as it were blackened with soot; the nine primary quill-feathers are black; the other secondary ones are likewise black, but their outward margin is purple; the twelve tail feathers have a blackish purple colour, and their tips are round; those on the outside are the shortest, and the middle extremely long. When the tail is spread, it looks round towards the extremity. The throat is blueish green, and shining; the breast is likewise black or shining green, according as you turn it to the light; the belly is blackish, and the vent feathers are obscurely purple-coloured; the parts of the breast and belly which are covered by the wings, are purple-coloured; the wings are black below, or rather sooty; and the thighs have blackish feathers; the legs (*tibiæ*), and the toes are of a shining black. It has four toes, as most birds have. The claws are black, and that on the back toe is longer than the

the rest. Dr. *Linnaeus* calls this bird *Gracula Quiscula*.

A FEW of these birds are said to winter in swamps, which are quite overgrown with thick woods; and they only appear in mild weather. But the greatest number go to the south at the approach of winter. To-day I saw them, for the first time this year. They flew in great flocks already. Their chief and most agreeable food is maize. They come in great swarms in spring, soon after the maize is put under ground. They scratch up the grains of maize, and eat them. As soon as the leaf comes out, they take hold of it with their bills, and pluck it up, together with the corn or grain; and thus they give a great deal of trouble to the country people, even so early in spring. To lessen their greediness of maize, some people dip the grains of that plant in a decoct of the root of the *veratrum album*, or white hellebore, (of which I shall speak in the sequel) and plant them afterwards. When the maize-thief eats a grain or two, which are so prepared, his head is disordered, and he falls down: this frightens his companions, and they dare not venture to the place again. But they repay themselves amply towards autumn, when the maize grows ripe; for at that time, they

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they are continually feasting. They assemble by thousands in the maize-fields, and live at discretion. They are very bold; for when they are disturbed, they only go and settle in another part of the field. In that manner, they always go from one end of the field to the other, and do not leave it till they are quite satisfied. They fly in incredible swarms in autumn; and it can hardly be conceived whence such immense numbers of them should come. When they rise in the air they darken the sky, and make it look quite black. They are then in such great numbers, and so close together, that it is surprising how they find room to move their wings. I have known a person shoot a great number of them on one side of a maize-field, which was far from frightening the rest; for they only just took flight, and dropped at about the distance of a musket-shot in another part of the field, and always changed their place when their enemy approached. They tired the sportsman, before he could drive them from off the maize, though he killed a great many of them at every shot. They likewise eat the seeds of the aquatic tare-grass (*Zizania aquatica*) commonly late in autumn, after the maize is got in. I am told, they likewise eat buck-wheat, and oats. Some people say,

say, that they even eat wheat, barley, and rye, when pressed by hunger ; yet, from the best information I could obtain, they have not been found to do any damage to these species of corn. In spring, they sit in numbers on the trees, near the farms ; and their note is pretty agreeable. As they are so destructive to maize, the odium of the inhabitants against them is carried so far, that the laws of *Pensylvania* and *New Jersey* have settled a premium of three-pence a dozen for dead maize-thieves. In *New England*, the people are still greater enemies to them ; for Dr. *Franklin* told me, in the spring of the year 1750, that, by means of the premiums which have been settled for killing them in *New England*, they have been so extirpated, that they are very rarely seen, and in a few places only. But as, in the summer of the year 1749, an immense quantity of worms appeared on the meadows, which devoured the grass, and did great damage, the people have abated their enmity against the maize-thieves ; for they thought they had observed, that those birds lived chiefly on these worms before the maize is ripe, and consequently extirpated them, or at least prevented their spreading too much. They seem therefore to be entitled, as it were, to a reward for their trouble.

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PURPLE JACKDAW.



RED-WINGED STARE.



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ble. But after these enemies and destroyers of the worms (the maize-thieves) were extirpated, the worms were more at liberty to multiply; and therefore they grew so numerous, that they did more mischief now than the birds did before. In the summer 1749, the worms left so little hay in *New England*, that the inhabitants were forced to get hay from *Pennsylvania*, and even from *Old England*. The maize-thieves have enemies besides the human species. A species of little hawks live upon them, and upon other little birds. I saw some of these hawks driving up the maize-thieves, which were in the greatest security, and catching them in the air. Nobody eats the flesh of the purple maize-thieves or daws (*Gracula quiscal*); but that of the red-winged maize-thieves, or starlings (*Oriolus Phœniceus*) is sometimes eaten. Some old people have told me, that this part of *America*, formerly called *New Sweden*, still contained as many maize-thieves as it did formerly. The cause of this they derive from the maize, which is now sown in much greater quantity than formerly; and they think that the birds can get their food with more ease at present.

The *American* whortleberry, or the *Vaccinium hispidulum*, is extremely abundant over

over all *North America*, and grows in such places where we commonly find our whortle-berries in *Sweden*. The *American* ones are bigger, but in most things so like the *Swedish* ones, that many people would take them to be mere varieties. The *English* call them *Cranberries*, the *Swedes* *Tranbær*, and the *French* in *Canada* *Atopa*, which is a name they have borrowed from the *Indians*. They are brought to market every *Wednesday* and *Saturday* at *Philadelphia*, late in autumn. They are boiled and prepared in the same manner as we do our red whortle-berries, or *Vaccinium vitis idæa*; and they are made use of during winter, and part of summer, in tarts and other kinds of pastry. But as they are very sour, they require a deal of sugar; but that is not very dear, in a country where the sugar-plantations are not far off. Quantities of these berries are sent over, preserved, to *Europe*, and to the *West Indies*.

March the 2d. *Mytilus anatinus*, a kind of muscle-shells, was found abundantly in little furrows, which crossed the meadows. The shells were frequently covered on the outside, with a thin crust of particles of iron, when the water in the furrows came from an iron mine. The *Englishmen* and
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Swedes settled here seldom made any use of these shells; but the *Indians* who formerly lived here boiled them and ate the flesh. Some of the *Europeans* eat them sometimes.

THE snow still remained in some parts of the wood, where it was very shady, but the fields were quite free from it. The cows, horses, sheep, and hogs, went into the woods, and sought their food, which was as yet very trifling.

March the 3d. THE *Swedes* call a species of little birds, *Snofogel*, and the *English* call it *Snow-bird*. This is Dr. *Linnaeus's* *Emberiza hyemalis*. The reason why it is called snow-bird is because it never appears in summer, but only in winter, when the fields are covered with snow. In some winters they come in as great numbers as the maize-thieves, fly about the houses and barns, into the gardens, and eat the corn, and the seeds of grass, which they find scattered on the hills.

AT eight o'clock at night we observed a meteor, commonly called a *snow-fire* *. I have described this meteor in the memoirs of the Royal *Swedish* Academy of Sciences, see the volume for the year 1752, page 154, 155.

* Probably nothing but an *Aurora borealis*.

WILD Pigeons, (*Columba migratoria* *), flew in the woods, in numbers beyond conception, and I was assured that they were more plentiful than they had been for several years past. They came this week, and continued here for about a fortnight, after which they all disappeared, or advanced further into the country, from whence they came. I shall speak of them more particularly in another place.

March the 7th. SEVERAL people told me, that it was a certain sign of bad weather here when a thunder-storm arose in the south or south west, if it spread to the east and afterwards to the north: but that on the contrary, when it did not spread at all, or when it spread both east and west, though it should rise in south or south west, yet it would prognosticate fair weather. To-day it was heard in south west, but it did not spread at all. See the meteorological observations, at the end of this volume.

TILL now the frost had continued in the ground, so that if any one had a mind to dig a hole he was forced to cut it through with a pick-ax. However it had not penetrated

* Of this *Pigeon of Passage* we have given here a plate, tab. ii. taken from a parcel of birds, lately brought from *America*, of which we were favoured with a fine specimen. F.

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AMERICAN MIGRATORY PIGEON.



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netrated above four inches deep. But to-day it was quite gone out. This made the soil so soft, that on riding, even in the woods, the horse sunk in very deep.

I often enquired among the old *Englishmen* and *Swedes*, whether they had found that any trees were killed in very severe winters, or had received much hurt. I was answered, that young hiccory trees are commonly killed in very cold weather; and the young black oaks likewise suffer in the same manner. Nay sometimes black oaks, five inches in diameter, were killed by the frost in a severe winter, and sometimes, though very seldom, a single mulberry-tree was killed. Peach-trees very frequently die in a cold winter, and often all the peach-trees in a whole district are killed by a severe frost. It has been found repeatedly, with regard to these trees, that they can stand the frost much better on hills, than in vallies; insomuch, that when the trees in a valley were killed by frost, those on a hill were not hurt at all. They assured me that they had never observed that the black walnut-tree, the sassafras, and other trees, had been hurt in winter. In regard to a frost in spring, they had observed at different times, that a cold night or two happened often after the trees were

furnished with pretty large leaves, and that by this most of the leaves were killed. But the leaves thus killed have always been supplied by fresh ones. It is remarkable that in such cold nights the frost acts chiefly upon the more delicate trees, and in such a manner, that all the leaves, to the height of seven and even of ten feet from the ground, were killed by the frost, and all the top remained unhurt. Several old *Swedes* and *Englishmen* assured me they had made this observation, and the attentive engineer, Mr. *Lewis Evans*, has shewn it me among his notes. Such a cold night happened here, in the year 1746, in the night between the 14th and 15th of *June*, new style, attended with the same effect, as appears from Mr. *Evans's* observations. The trees which were then in blossom, had lost both their leaves and their flowers in these parts which were nearest the ground; sometime after they got fresh leaves, but no new flowers. Further it is observable, that the cold nights which happen in spring and summer never do any hurt to high grounds, damaging only the low and moist ones. They are likewise very perceptible in such places where limestone is to be met with, and though all the other parts of the country be not visited by such cold

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cold nights in a summer, yet those where limestone lies have commonly one or two every summer. Frequently the places where the limestone lies are situated on a high ground; but they suffer notwithstanding their situation; whilst a little way off in a lower ground, where no limestone is to be found, the effects of the cold nights are not felt. Mr. *Evans* was the first who made this observation, and I have had occasion at different times to see the truth of it, on my travels, as I shall mention in the sequel. The young hiccory-trees have their leaves killed sooner than other trees, in such a cold night, and the young oaks next; this has been observed by other people, and I have found it to be true, in the years 1749 and 1750.

March the 11th. Of the genus of *Wood-peckers*, we find here all those, which *Catesby* in his first volume of the *Natural History of Carolina*, has drawn and described. I shall only enumerate them, and add one or two of their qualities; but their description at large I defer for another occasion.

Picus principalis, the *King of the Wood-peckers*, is found here, though very seldom, and only at a certain season.

Picus pileatus, the crested *Wood-pecker*; this I have already mentioned.

Picus auratus, the *gold-winged Wood-pecker*: This species is plentiful here, and the *Swedes* call it *Hittock*, and *Piut*; both these names have a relation to its note; it is almost continually on the ground, and is not observed to pick in the trees; it lives chiefly on insects, but sometimes becomes the prey of hawks; it is commonly very fat, and its flesh is very palatable. As it stays all the year, and cannot easily get insects in winter, it must doubtless eat some kinds of grass or plants in the fields. Its form, and some of its qualities, make it resemble a cuckow.

Picus Carolinus, the *Caroline Wood-pecker*. It lives here likewise, and the colour of its head is of a deeper and more shining red than *Catesby* has represented it, vol. i. p. 19. t. 19.

Picus villosus, the *spotted, bairy, middle-sized Wood-pecker* is abundant here; it destroys the apple-trees by pecking holes into them.

Picus erythrocephalus, the *red-headed Wood-pecker*. This bird was frequent in the country, and the *Swedes* called it merely *Hackspick*, or *Wood pecker*. They give the same name to all the birds which I now enumerate, the gold-winged wood-pecker excepted. This species is destructive

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tive to maize-fields and orchards, for it pecks through the ears of maize, and eats apples. In some years they are very numerous, especially where sweet apples grow, which they eat so far, that nothing but the mere peels remain. Some years ago there was a premium of two pence *per* head, paid from the public funds, in order to extirpate this pernicious bird, but this law has been repealed. They are likewise very fond of acorns. At the approach of winter they travel to the southward. But when they stay in numbers in the woods, at the beginning of winter, the people look upon it as a sign of a pretty mild winter.

Picus varius, the *lesser, spotted, yellow-bellied Wood-pecker*. These birds are much more numerous than many people wished; for this, as well as the preceding and succeeding species, are very hurtful to apple-trees.

Picus pubescens, or the *least spotted Wood-pecker*. This species abounds here. Of all the wood-peckers it is the most dangerous to orchards, because it is the most daring. As soon as it has pecked a hole into the tree, it makes another close to the first, in a horizontal direction, proceeding till it has pecked a circle of holes



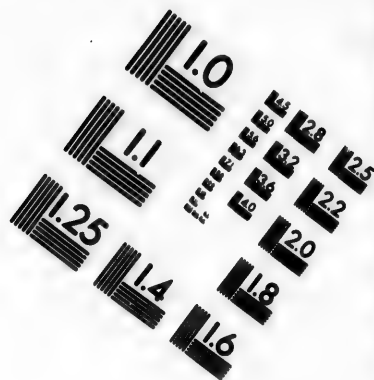
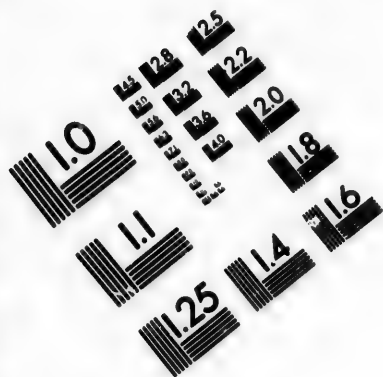
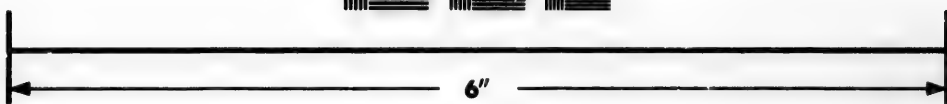
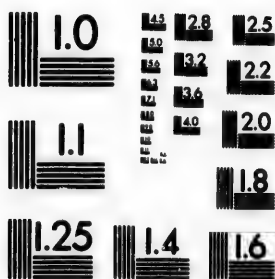


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round the tree. Therefore the apple-trees in the orchards here have several rings round their stems, which lie very close above each other, frequently only an inch distant from each other. Sometimes these wood-peckers peck the holes so close, that the tree dries up. This bird, as *Catesby* remarks, is so like the lesser spotted wood-pecker, in regard to its colour and other qualities, that they would be taken for the same bird, were not the former (the *Picus pubescens*) a great deal less. They agree in the bad quality, which they both possess, of pecking holes into the apple-trees.

Rana ocellata are a kind of frogs here, which the *Swedes* call, *Sill-hoppetoffer*, i. e. *Herring-hoppers*, and which now began to quack in the evening, and at night, in swamps, pools, and ponds. The name which the *Swedes* give them is derived from their beginning to make their noise in spring, at the same time when the people here go catching what are called herrings, which however differ greatly from the true *European* herrings. These frogs have a peculiar note, which is not like that of our *European* frogs, but rather corresponds with the chirping of some large birds, and can nearly be expressed by *picet*. With this noise they continued throughout a great
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part of spring, beginning their noise soon after sun-setting, and finishing it just before sun-rising. The sound was sharp, but yet so loud that it could be heard at a great distance. When they expected rain they cried much worse than commonly, and began in the middle of the day, or when it grew cloudy, and the rain came usually six hours after. As it snowed on the 16th of the next month, and blew very violently all day, there was not the least sign of them at night, and during the whole time that it was cold, and whilst the snow lay on the fields, the frost had so silenced them, that we could not hear one; but as soon as the mild weather returned, they began their noise again. They were very timorous, and it was difficult to catch them; for as soon as a person approached the place where they lived, they are quite silent, and none of them appeared. It seems that they hide themselves entirely under water, except the tip of the snout, when they cry. For when I stepped to the pond where they were in, I could not observe a single one hopping into the water. I could not see any of them before I had emptied a whole pool, where they lodged in. Their colour is a dirty green, variegated with spots of brown. When they

they are touched they make a noise and moan; they then sometimes assume a form, as if they had blown up the hind part of the back, so that it makes a high elevation; and then they do not stir, though touched. When they are put alive into spirits of wine, they die within a minute.

March the 12th. THE bird which the *English* and *Swedes* in this country call *Robin-red-breast**, is found here all the year round. It is a very different bird from that which in *England* bears the same name. It is *Linnaeus's Turdus migratorius*. It sings very melodiously, is not very shy, but hops on the ground, quite close to the houses.

THE *Hazels* (*Corylus avellana*) were now opening their blossoms. They succeeded best in a rich mould, and the *Swedes* reckoned it a sign of a good soil where they found them growing.

March the 13th. THE *alder* (*Betula Alnus*) was just blossoming.

THE *Dracontium foetidum* grew plentifully in the marshes and began to flower. Among the stinking plants, this is the most foetid; its nauseous scent was so strong, that I could hardly examine the flower; and

* Of this bird we have given a figure in plate 3, where likewise the *Mocking-bird* is represented; both drawn after specimens lately brought from *America*, and which we were favoured with. F.

MOCKING BIRD.



REDBREASTED THRUSH.



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and when I smelled a little too long at it, my head ached. The *Swedes* call it *Byorn-blad* (bear's-leaf) or *Byorn-retter* (bear's-root.) The *English* call it *Polecat-root*, because its effluvia are as nauseous and fœtid, as those of the polecat, which I have mentioned before. The flowers are purple-coloured; when they are in full flower, the leaves begin to come out of the ground; in summer the cattle do not touch it. Dr. *Golden* told me, that he had employed the root in all cases where the root of the arum is made use of, especially against the scurvy, &c. The *Swedish* name it got, because the bears, when they leave their winter habitations, are fond of it in spring: It is a common plant in all *North America*.

THE *Draba verna* was abundant here, and now appeared in flower.

THE *Veratrum album* was very common in the marshes, and in low places over all *North America*. The *Swedes* here call it *Dack*, *Dackor* or *Dackretter*, that is puppet-root, because the children make puppets of its stalks and leaves. The *English* call it *Itch-reed* or *Ellebore*. It is a poisonous plant, and therefore the cattle never touch it; however it sometimes happens that the cattle are deceived in the beginning of spring, when the pastures are bare, and eat of the fine broad green leaves of this plant,
which

which come up very early ; but such a meal frequently proves fatal to them. Sheep and geese have likewise often been killed with it. By means of its root, the maize is preserved from the greediness of voracious birds, in the following manner : The roots are boiled in water, into which the maize is put as soon as the water is quite cool ; the maize must ly all night in it, and is then planted as usual. When the maize-thieves, crows, or other birds, pick up or pluck out the grains of maize, their heads grow delirious, and they fall, which so frightens the rest that they never venture on the field again ; when those which have tasted the grains recover, they leave the field, and are no more tempted to visit it again. By thus preparing maize, one must be very careful that no other creatures touch it ; for when ducks or fowls eat a grain or two of the maize which is thus steeped, they become very sick ; but if they swallow a considerable quantity they die. When the root is thrown away raw, no animal eats it ; but when it is put out boiled, its sweet taste tempts the beasts to eat it. Dogs have been seen to eat a little of it, and have been very sick after it ; however they have recovered after a vomit, for when animals cannot free themselves of it by this means, they often die. Some people boil the root, and wash

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wash the scorbutic parts with the water or decoct. This is said to cause some pain, and even a plentiful discharge of urine, but it re-establishes the patient. When the children here are plagued with vermin, the women boil this root, put the comb into the decoction, and comb the head with it, and this kills them most effectually.

March the 17th. AT the first arrival of the *Swedes* in this country, and long after that time, it was filled with *Indians*. But as the *Europeans* proceeded to cultivate the land, the *Indians* sold their land, and went further into the country. But in reality few of the *Indians* really left the country in this manner; most of them ended their days before, either by wars among themselves, or by the small-pox, a disease which the *Indians* were unacquainted with before their commerce with the *Europeans*, and which since that time has killed incredible numbers of them. For though they can heal wounds and other external hurts, yet they know not how to proceed with fevers, or in general with internal diseases. One can imagine, how ill they would succeed with the cure of the small-pox, when as soon as the pustules appeared, they leaped naked into the cold water of the rivers, lakes, or fountains, and either dived over head

head into it, or poured it over their body in great abundance, in order to cool the heat of the fever. In the same manner they carry their children, when they have the small-pox, into the water and duck them*. But brandy has killed most of the *Indians*. This liquor was likewise entirely unknown to them, before the *Europeans* came hither; but after they had tasted it, they could never get enough of it. A man can hardly have a greater desire of a thing, than the *Indians* have of brandy. I have heard them say, that to die by drinking brandy, was a desirable

* Professor *Kalm* wrote this, when the truly laudable method of treating the small-pox with a cold regimen, was not yet adopted; and he thought therefore, the way in which the *Americans* treated this disease, was the cause of its being so deleterious. But when the *Kbalmucks*, in the *Russian* dominions, get the small-pox, it has been observed, that very few escape. Of this I believe no other reason can be alledged, than that the small-pox is always dangerous, either when the open pores of the human skin are too numerous, which is caused by opening them in a warm water bath; or when they are too much closed, which is the case with all the nations, that are dirty and greasy. All the *American Indians* rub their body with oils, the *Kbalmucks* never wash themselves, and rub their bodies and their fur-coats with grease; the *Hottentots* are I believe known to be patterns of filthiness, their bodies being richly anointed with their ornamental greasy sheep-guts; this shuts up all the pores; hinders perspiration entirely, and makes the small-pox always lethal among these nations; to which we may yet add the too frequent use of spirituous inflammatory liquors, since their acquaintance with the *Europeans*. F.

desirable and an honourable death; and indeed 'tis no very uncommon thing to kill themselves by drinking this liquor to excess.

THE food of these *Indians* was very different from that of the inhabitants of the other parts of the world. Wheat, rye, barley, oats, and rice-groats, were quite unknown in *America*. In the same manner it is with regard to the fruits and herbs which are eaten in the old countries. The maize, some kinds of beans, and melons, made almost the whole of the *Indian* agriculture and gardening; and dogs were the only domestic animals in *North America*. But as their agriculture and their gardening were very trifling, and they could hardly live two months in a year upon their produce, they were forced to apply to hunting and fishing, which at that time, and even at present, are their chief subsistence, and to seek some of the wild plants and trees here. Some of the old *Swedes* were yet alive, who in their younger years had an intercourse with the *Indians*, and had seen the minutiae of their œconomy. I was therefore desirous of knowing which of the spontaneous herbs they made use of for food at that time; and all the old men agreed that the following plants were what they chiefly consumed :

HOPNISS or *Hapniss* was the *Indian* name of a wild plant, which they ate at that time. The *Swedes* still call it by that name, and it grows in the meadows in a good soil. The roots resemble potatoes, and were boiled by the *Indians*, who eat them instead of bread. Some of the *Swedes* at that time likewise ate this root for want of bread. Some of the *English* still eat them instead of potatoes. Mr. *Bartram* told me, that the *Indians* who live farther in the country do not only eat these roots, which are equal in goodness to potatoes, but likewise take the pease which ly in the pods of this plant, and prepare them like common pease. Dr. *Linnaeus* calls the plant *Glycine Apios*.

KATNISS is another *Indian* name of a plant, the root of which they were likewise accustomed to eat, when they lived here. The *Swedes* still preserve this name. It grows in low, muddy and very wet ground. The root is oblong, commonly an inch and an half long, and one inch and a quarter broad in the middle; but some of the roots have been as big as a man's fists. The *Indians* either boiled this root or roasted it in hot ashes. Some of the *Swedes* likewise eat them with much appetite, at the time when the *Indians* were so near the coast; but at present none of them make any use of

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of the roots. A man of ninety-one years of age, called *Nils Gustafson*, told me, that he had often eaten these roots when he was a boy, and that he liked them very well at that time. He added that the *Indians*, especially their women, travelled to the islands, dug out the roots, and brought them home; and whilst they had them, they desired no other food. They said that the hogs, which are amazingly greedy of them, have made them very scarce. The cattle are very fond of its leaves. I afterwards got some of these roots roasted, and in my opinion they tasted well, though they were rather dry: The taste was nearly the same with that of the potatoes. When the *Indians* come down to the coast and see the turneps of the *Europeans*, they likewise give them the name of *katnifs*. Their *katnifs* is an arrow-head or *Sagittaria*, and is only a variety of the *Swedish* arrow-head or *Sagittaria sagittifolia*, for the plant above the ground is entirely the same, but the root under ground is much greater in the *American* than in the *European*. Mr. *Osbeck* in his voyage to *China*, vol. i. p. 334, of the *English* edition, mentions, that the *Chinese* plant a *Sagittaria*, and eat its roots. This seems undoubtedly to be a variety of this *katnifs*. Further in the north of this

part of *America*, I met with the other species of *Sagittaria* which we have in *Sweden*.

TAW-HO and *Taw-him* was the *Indian* name of another plant, the root of which they eat. Some of them likewise call it *Tuckab*; but most of the *Swedes* still knew it by the name of *Taw-bo*. It grows in moist ground and swamps. Hogs are very greedy of the roots, and grow very fat by feeding on them. Therefore, they often visit the places where these roots grow; and they are frequently seen rooting up the mud, and falling with their whole body into the water, so that only a little of the back part was out of the water. It is therefore very plain, that these roots must have been extirpated in places which are frequented by hogs. The roots often grow to the thickness of a man's thigh. When they are fresh, they have a pungent taste, and are reckoned a poison in that fresh state. Nor did the *Indians* ever venture to eat them raw but prepared them in the following manner: They gathered a great heap of these roots, dug a great long hole, sometimes two or three fathoms and upwards in length, into which they put the roots, and covered them with the earth that had been taken out of the hole; they made a great fire above it, which burnt till they thought proper to remove it; and then

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they dug up the roots, and consumed them with great avidity. These roots, when prepared in this manner, I am told, taste like potatoes. The *Indians* never dry and preserve them; but always take them fresh out of the marshes, when they want them. This *Taw-ho* is the *Arum Virginicum*, or *Virginian Wake-robin*. It is remarkable, that the Arums, with the plants next akin to them, are eaten by men in different parts of the world, though their roots, when raw, have a fiery pungent taste, and are almost poisonous in that state. How can men have learnt, that plants so extremely opposite to our nature were eatable; and that their poison, which burns on the tongue, can be conquered by fire. Thus the root of the *Calla palustris*, which grows in the north of *Europe*, is sometimes used instead of bread on an exigency. The *North American Indians* consume this species of Arum. Those of *South America*, and of the *West Indies*, eat other species of Arums. The *Hottentots*, at the *Cape of Good Hope*, in *Africa*, prepare bread from a species of *Arum* or *Wake-robin*, which is as burning and poisonous as the other species of this plant. In the same manner, they employ the roots of some kinds of Arum as a food, in *Egypt* and *Asia*. Pro-

bably, that severe but sometimes useful mistress, necessity, has first taught men to find out a food, which the first taste would have rejected as useless. This *Taw-ho* seems to be the same with what the *Indians* in *Carolina* call *Tuckahoo*; and of which see Vol. I. p. 287.

TAW-KEE is another plant, so called by the *Indians*, who eat it. Some of them call it *Taw-kim*, and others *Tackvim*. The *Swedes* call it always by the name of *Taw-kee*. The plant grows in marshes, near moist and low grounds, and is very plentiful in *North America*. The cattle, hogs and stags, are very fond of the leaves in spring; for they are some of the earliest. The leaves are broad, like those of the *Convallaria*, or Lilly of the Valley, green on the upper side, and covered with very minute hair, so that they looked like a fine velvet. The *Indians* pluck the seeds, and keep them for eating. They cannot be eaten fresh or raw, but must be dried. The *Indians* were forced to boil them repeatedly in water, before they were fit for use; and then they ate them like pease. When the *Swedes* gave them butter or milk, they boiled or broiled the seeds in it. Sometimes they employ these seeds instead of bread; and they taste like pease. Some of the *Swedes* like-

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wise ate them; and the old men among them told me, they liked this food better than any of the other plants which the *Indians* formerly made use of. This *Taw-kee* was the *Orontium aquaticum*.

BILBERRIES were likewise a very common dish among the *Indians*. They are called *Huckleberries* by the *English* here, and belong to several species of *Vaccinium*, which are all of them different from our *Swedish* Bilberry-bush, though their berries, in regard to colour, shape, and taste, are so similar to the *Swedish* bilberry, that they are distinguished from each other with difficulty. The *American* ones grow on shrubs, which are from two to four feet high; and there are some species which are above seven feet in height. The *Indians* formerly plucked them in abundance every year, dried them either in the sun-shine or by the fire-side, and afterwards prepared them for eating, in different manners. These huckleberries are still a dainty dish among the *Indians*. On my travels through the country of the *Iroquese*, they offered me, whenever they designed to treat me well, fresh maize-bread, baked in an oblong shape, mixed with dried *Huckleberries*, which lay as close in it as the raisins in a plumb-pudding. I shall

write more at large about it in the sequel. The *Europeans* are likewise used to collect a quantity of these berries, to dry them in ovens, to bake them in tarts, and to employ them in several other ways. Some preserve them with treacle. They are likewise eaten raw, either quite alone or with fresh milk.

I SHALL, on the 27th of *March*, find occasion to mention another dish, which the *Indians* ate formerly, and still eat, on formal ceremonies.

March the 18th. ALMOST during the whole of this spring, the weather and the winds were always calm in the morning at sun-rising. At eight o'clock the wind began to blow pretty hard, and continued so all day, till sun-setting; when it ceased, and all the night was calm. This was the regular course of the weather; but sometimes the winds raged, without intermission, for two or three days together. At noon it was commonly most violent. But in the ordinary way, the wind decreased and increased as follows: At six in the morning, a calm; at seven, a very gentle western breeze, which grew stronger at eight; at eleven it was much stronger; but at four in the afternoon, it is no stronger than it was
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at eight o'clock in the morning; and thus it goes on decreasing till it is quite a calm, just before sun-set. The winds this spring blew generally west, as appears from the observations at the end of this volume.

I WAS told, that it was a very certain prognostic of bad weather, that when you see clouds in the horizon in the south-west, about sun-setting, and when those clouds sink below the horizon, in an hour's time, it will rain the next day, though all the forenoon be fair and clear. But if some clouds be seen in the south-west, in the horizon, at sun-set, and they rise some time after, you may expect fair weather the next day.

March the 20th. AN old *Swede* prognosticated a change in the weather, because it was calm to-day; for when there has been wind for some days together, and a calm follows, they say, rain or snow, or some other change in the weather, will happen. I was likewise told, that some people here were of that false opinion, that the weather commonly alters on *Friday*; so that, in case it had rained or blown hard all the week, and a change was to happen, it would commonly fall on *Friday*. How far the former prognostic has been true, appears from my own observations of the weather, to which I refer.

March the 21st. The red maple (*Acer rubrum*) and the *American elm* (*Ulmus Americana*) began to flower at present; and some of the latter kind were already in full blossom.

March the 24th. I WALKED pretty far to-day, in order to see whether I could find any plants in flower. But the cloudy weather, and the great rains which had lately fallen, had allowed little or nothing to grow up. The leaves now began to grow pretty green. The plants which I have just before mentioned, were now in full blossom.

THE noble Liverwort, or *Anemone hepatica*, was now every where in flower. It was abundant; and the *Swedes* called it *Blablonster*, or Blue-flower. They did not know any use of it.

NEAR all the corn-fields on which I walked to-day, I did not see a single ditch, though many of them wanted it. But the people generally followed the *English* way of making no ditches along the fields, without considering whether the corn-fields wanted them or not. The consequence was, that the late rain had in many places washed away great pieces of the grounds, sown with wheat and rye. There were no ridges left between the fields, except a very narrow one near the fence, which was entirely over-grown with

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with the Sumach, or *Rhus glabra*, and with black-berry bushes, so that there the cattle could find very little or no food. The corn fields were *broad-cast*, or divided into pieces, which were near seventeen feet broad, and separated from each other only by means of furrows. These pieces were uniform, and not elevated in the middle.

MELOE majalis, a species of oil-beetle, crept about on the hills.

PAPILIO Antiopa, or willow butterfly, flew in the woods to-day, and was the first butterfly which I saw this year.

PAPILIO Euphrosyne, or the *April* butterfly, was one of the scarce species. The other *American* insect, which I described this day and the following days, I shall mention on some other occasion. In the sequel I shall only mention those which were remarkable for some peculiar qualities.

THE hay-stacks were commonly made here after the *Swedish* manner, that is, in the shape of a thick and short cone, without any cover over it. When the people wanted any hay, they cut some of it loose, by a peculiar sort of a knife. However, many people, especially in the environs of *Philadelphia*, had hay-stacks with roofs which could be moved up and down.

Near

Near the surface of the ground were some poles laid, on which the hay was put, that the air may pass freely through it. I have mentioned before, that the cattle have no stables in winter or summer, but must go in the open air, during the whole year. However, in *Philadelphia*, and in a few other places, I have seen that those people who made use of the latter kind of hay-stacks, viz. that with moveable roofs, commonly had built them so, that the hay was put a fathom or two above the ground, on a floor of boards, under which the cattle could stand in winter, when the weather was very bad. Under this floor of boards were partitions of boards on all the sides, which however stood far enough from each other, to afford the air a free passage.

March the 27th. In the morning I went in order to speak with the old *Swede*, *Nils Gustafson*, who was ninety-one years of age. I intended to get an account of the former state of *New Sweden*. The country which I now passed through was the same with that which I had found in those parts of *North America* I had hitherto seen. It was diversified with a variety of little hills and vallies: the former consisted of a very pale brick-coloured earth, composed, for the greatest part, of a fine sand,

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sand, mixed with some mould. I saw no mountains, and no stones, except some little stones, not above the size of a pigeon's or hen's egg, lying on the hills, and commonly consisting of white quartz, which was generally smooth and polished on the outside. At the bottom, along the vallies, ran sometimes rivulets of crystalline water, the bottom of which was covered with such white pebbles as I have just described. Now and then I met with a swamp in the vallies. Sometimes there appeared, though at considerable distances from each other, some farms, frequently surrounded on all sides by corn-fields. Almost on every corn-field there yet remained the stumps of trees, which had been cut down; a proof that this country has not been long cultivated, being overgrown with trees forty or fifty years ago. The farms did not ly together in villages, or so that several of them were near each other, in one place; but they were all separated from one another. Each countryman lived by himself, had his own ground about his house, separated from the property of his neighbour. The greatest part of the land, between these farms so distant from each other, was over-grown with woods, consisting of tall trees. However, there was a fine space between

between the trees, so that one could ride on horseback without inconvenience in the woods, and even with a cart in most places; and the ground was very plain and uniform at the same time. Here and there appeared some fallen trees, thrown down by the wind; some were torn up by the roots; others broken quite across the stem. In some parts of the country the trees were thick and tall, but in others I found large tracts covered with young trees, only twenty, thirty, or forty years old: these tracts, I am told, the *Indians* formerly had their little plantations in. I did not yet see any marks of the leaves coming out, and I did not meet with a flower in the woods: for the cold winds, which had blown for several days together successively, had hindered this. The woods consisted chiefly of several species of oak, and of hiccory. The swamps were filled with red maple, which was all now in flower, and made these places look quite red at a distance.

THE old *Swede*, whom I came to visit, seemed to be still pretty hearty and fresh, and could walk by the help of a stick; but he complained of having felt in these latter years, some pains in his back, and limbs, and that he could keep his feet warm in winter only by sitting near the fire.

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He said he could very well remember the state of this country, at the time when the *Dutch* possessed it, and in what circumstances it was in before the arrival of the *Englisch*. He added, that he had brought a great deal of timber to *Philadelphia*, at the time that it was built. He still remembered to have seen a great forest on the spot where *Philadelphia* now stands. The father of this old man had been one of the *Swedes* who were sent over from *Sweden*, in order to cultivate and inhabit this country. He returned me the following answers to the questions I asked him.

QUERE, Whence did the *Swedes*, who first came hither, get their cattle? The old man answered, that when he was a boy, his father and other people had told him, that the *Swedes* brought their horses, cows, and oxen, sheep, hogs, geese, and ducks, over with them. There were but few of a kind at first, but they multiplied greatly here afterwards. He said, that *Maryland*, *New York*, *New England*, and *Virginia*, had been sooner inhabited by *Europeans* than this part of the country; but he did not know whether the *Swedes* ever got cattle of any kind, from any of these provinces, except from *New York*. Whilst he was yet very young, the *Swedes*, as well

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as he could remember, had already a sufficient stock of all these animals. The hogs had propagated so much at that time, there being so great a plenty of food for them, that they ran about wild in the woods, and that the people were obliged to shoot them, when they intended to make use of them. The old man likewise recollected, that horses ran wild in the woods, in some places; but he could not tell whether any other kind of cattle turned wild. He thought that the cattle grow as big at present as they did when he was a boy, supposing they get as much food as they want. For in his younger years, food for all kinds of cattle was so plentiful, and even so superfluous, that the cattle were extremely well fed by it. A cow at that time gave more milk, than three or four do at present; but she got more and better food at that time, than three or four get now; and, as the old man said, the scanty allowance of grass, which the cattle get in summer, is really very pitiful. The causes of this scarcity of grass have already been mentioned.

QUERE, Whence did the *English* in *Pennsylvania* and *New Jersey* get their cattle? They bought them chiefly from the *Swedes* and *Dutch*, who lived here; and
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a small number were brought over from *Old England*. The form of the cattle, and the unanimous accounts of the *English* here, confirmed what the old man had said.

QUERE, Whence did the *Swedes* here settled get their several sorts of corn, and likewise their fruit-trees and kitchen-herbs? The old man told me that he had frequently heard, when he was young, that the *Swedes* had brought all kinds of corn, and fruits, and herbs, or seeds of them, with them. For, as far as he could recollect, the *Swedes* here were plentifully provided with wheat, rye, barley, and oats. The *Swedes*, at that time, brewed all their beer of malt made of barley, and likewise made good strong beer. They had already got distilling vessels, and made good brandy. Every one among them had not a distilling vessel, but when they intended to distil, they lent their apparatus to one another. At first they were forced to buy maize of the *Indians*, both for sowing and eating. But after continuing for some years in this country, they extended their maize-plantations so much that the *Indians* were obliged some time after to buy maize of the *Swedes*. The old man likewise assured me, that the *Indians*

Indians formerly, and about the time of the first settling of the *Swedes*, were more industrious and laborious in every branch of business, than they are now. Whilst he was young, the *Swedes* had a great quantity of very good *white cabbage*. *Winter cabbage*, or *Cale*, which was left on the ground during winter, was likewise abundant. They were likewise well provided with turnips. In winter they kept them in holes under ground. But the old man did not like that method; for when they had lain too long in these holes, in winter, they became spongy. He preferred that method of keeping them which is now commonly adopted, and which consists in the following particulars. After the turnips have been taken out of the ground in autumn, and exposed to the air for a while, they are put in a heap upon the field, covered with straw at the top, and on the sides, and with earth over the straw. By this means they stand the winter very well here, and do not become spongy. The *Indians* were very fond of turneps, and called them sometimes *Hopniss*, sometimes *Katniss*. The *Swedes* likewise cultivated carrots, in the old man's younger years. Among the fruit-trees were *Apple-trees*.

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They were not numerous, and only some of the *Swedes* had little orchards of them, whilst others had not a single tree. None of the *Swedes* made cyder, for it is come into use but lately. The *Swedes* brewed strong beer and small beer, and it was their common liquor. But at present there are very few who brew beer, for they commonly prepare cyder. *Cherry-trees* were abundant when *Nils Gustafson* was yet a boy. Peach-trees were at that time more numerous than at present, and the *Swedes* brewed beer of the fruit. The old man could not tell from whence the *Swedes* first of all got the peach-trees.

DURING the younger years of this old man, the *Indians* were every where spread in the country; they lived among the *Swedes*, and were scattered every where. The old man mentioned *Swedes* who had been killed by the *Indians*; and he mentioned two of his countrymen who had been scalped by them. They stole children from the *Swedes*, and carried them off, and they were never heard of again. Once they came and killed some *Swedes*, and took the upper part of their skulls with them; on that occasion they scalped a little girl, and would have killed her, if they had not perceived a boat full of *Swedes*, making towards them,

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which obliged them to fly; the girl was afterwards healed, but never got any hair on her head again; she was married, had many children, and lived to a considerable age. At another time, the *Indians* attempted to kill the mother of this old man, but she vigorously resisted them, and in the mean while a number of *Swedes* came up, who frightened the *Indians*, and made them run away. Nobody could ever find out to what nation of *Indians* these owe their origin; for in general they lived very peaceably with the *Swedes*.

THE *Indians* had their little plantations of maize in many places; before the *Swedes* came into this country, the *Indians* had no other than their hatchets made of stone; in order to make maize plantations they cut out the trees and prepared the ground in the manner I have before mentioned*. They planted but little maize, for they lived chiefly upon hunting; and throughout the greatest part of summer, their *Hopniss* or the roots of the *Glycine Apios*, their *Katniss*, or the roots of the *Sagittaria Sagittifolia*, their *Taw-bo* or the roots of the *Arum Virginicum*, their *Taw-kee* or *Orontium aquaticum*, and whortleberries, were their chief food. They had

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* In page 39 of this Volume.

no horses or other cattle which could be subservient to them in their agriculture, and therefore did all the work with their own hands. After they had reaped the maize, they kept it in holes under ground, during winter; they dug these holes seldom deeper than a fathom, and often not so deep; at the bottom and on the sides they put broad pieces of bark. The *Andropogon bicornis*, a grass which grows in great plenty here, and which the *English* call *Indian Grass*, and the *Swedes* *Wilket Grass**, supplies the want of bark; the ears of maize are then thrown into the hole and covered to a considerable thickness with the same grass, and the whole is again covered by a sufficient quantity of earth: the maize kept extremely well in those holes, and each *Indian* had several such subterraneous stores, where his corn lay safe, though he travelled far from it. After the *Swedes* had settled here and planted apple-trees and peach-trees, the *Indians*, and especially their women, sometimes stole the fruit in great quantity; but when the *Swedes* caught them, they gave them a severe drubbing, took the fruit from them, and often their clothes too. In the same manner it

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* Grass of the savages.

happened sometimes that as the *Swedes* had a great encrease of hogs, and they ran about in the woods, the *Indians* killed some of them privately and feasted upon them: but there were likewise some *Indians* who bought hogs of the *Swedes* and fed them; they taught them to run after them like dogs, and whenever they removed from one place to another, their hogs always followed them. Some of those *Indians* got such numbers of these animals, that they afterwards gave them to the *Swedes* for a mere trifle. When the *Swedes* arrived in *America*, the *Indians* had no domestic animals, except a species of little dogs. The *Indians* were extremely fond of milk, and ate it with pleasure when the *Swedes* gave it them. They likewise prepared a kind of liquor like milk in the following manner: they gathered a great number of hickory nuts and walnuts from the black walnut-trees, dried and crushed them; then they took out the kernels, pounded them so fine as flour, and mixed this flour with water, which took a milky hue from them, and was as sweet as milk. They had tobacco-pipes of clay, manufactured by themselves, at the time that the *Swedes* arrived here; they did not always smoke true tobacco, but made use of another plant instead of it, which was

was unknown to the old *Swedes*, but of which he assured me that it was not the common mullein, or *Verbascum Thapsus*, which is generally called *Indian Tobacco* here*.

As to their religion, the old man thought it very trifling, and even believed that they had none at all; when they heard loud claps of thunder, they said that the evil spirit was angry; some of them said that they believed in a God, who lives in heaven. The old *Swede* once walked with an *Indian*, and they met with a red-spotted snake on the road: the old man therefore went to seek a stick in order to kill the snake; but the *Indian* begged he would not touch it, because he adored it: perhaps the *Swede* would not have killed it, but on hearing that it was the *Indian's* deity, he took a stick and killed it, in the presence of the *Indian*, saying: Because thou believest in it, I think myself obliged to kill it. Sometimes the *Indians* came into the *Swedish* churches, looked at them, heard them, and went away again, after a while. One day as this old *Swede* was at church, and did not sing, because he had no Psalm-book by him, one of the *Indians*, who was

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* In the *Swedish* language *Wilket Toback*.

well acquainted with him, tapped him on the shoulder, and said : *Why dost thou not sing with the others, Tantanta ! Tantanta ! Tantanta ?* On another occasion, as a sermon was preached in the *Swedish* church, at *Raccoon*, an *Indian* came in, looked about him ; and, after hearkening a while to the preacher, he said : *Here is a great deal of prattle and nonsense, but neither brandy nor cyder ;* and went out again. For it is to be observed, that when an *Indian* makes a speech to his companions, in order to encourage them to war, or to any thing else, they all drink immoderately on those occasions.

At the time when the *Swedes* arrived, they bought land at a very inconsiderable price. For a piece of baize, or a pot full of brandy, or the like, they could get a piece of ground, which at present would be worth more than four hundred pounds, *Pensylvania* currency. When they sold a piece of land, they commonly signed an agreement ; and though they could neither read nor write, yet they scribbled their marks, or signatures, at the bottom of it. The father of old *Nils Gustafson* bought a piece of ground from the *Indians* in *New Jersey*. As soon as the agreement was drawn up, and the *Indians* should sign it, one of them,

them, whose name signified a beaver, drew a beaver, another of them drew a bow and arrow, and a third a mountain, instead of their names. Their canoes they made of thick trees; which they hollowed out by fire, and made them smooth again with their hatchets, as has been before mentioned.

THE following account the old man gave me, in answer to my questions with regard to the weather and its changes: It was his opinion, that the weather had always been pretty uniform ever since his childhood; that there happen as great storms at present as formerly; that the summers now are sometimes hotter, sometimes colder, than they were at that time; that the winters were often as cold and as long as formerly; and that still there often falls as great a quantity of snow as in former times. However, he thought that no cold winter came up to that which happened in the year 1697; and which is often mentioned in the almanacks of this country; and I have mentioned it in the preceding volume. For in that winter the river *Delaware* was so strongly covered with ice, that the old man brought many waggons full of hay over it, near *Christina*; and that it was passable in sledges even lower. No cattle, as far as he

could recollect, were starved to death in cold winters ; except, in later years, such cattle as were lean, and had no stables to retire into. It commonly does not rain, neither more nor less, in summer than it did formerly ; excepting that, during the last years, the summers have been more dry. Nor could the old *Swede* find a diminution of water in brooks, rivers, and swamps. He allowed, as a very common and certain fact, that wherever you dig wells, you meet with oyster-shells in the ground.

THE old *Gustafson* was of opinion, that intermitting fevers were as frequent and violent formerly as they are now ; but that they seemed more uncommon, because there were fewer people at that time here. When he got this fever, he was not yet full grown. He got it in summer, and had it till the ensuing spring, which is almost a year ; but it did not hinder him from doing his work, either within or out of doors. *Pleurisy* likewise attacked one or two of the *Swedes* formerly ; but it was not near so common as it is now. The people in general were very healthy at that time.

SOME years ago, the old *Swede's* eyes were so much weakened that he was forced to make use of a pair of spectacles. He then got a fever ; which was so violent, that

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that it was feared he would not recover, However, he became quite well again, and at the same time got new strength in his eyes ; so that he has been able to read without spectacles since that time.

THE houses which the *Swedes* built when they first settled here, were very bad. The whole house consisted of one little room, the door of which was so low, that one was obliged to stoop in order to get in. As they had brought no glass with them, they were obliged to be content with little holes, before which a moveable board was fastened. They found no moss, or at least none which could have been serviceable in stopping up holes or cracks in the walls. They were therefore forced to close them, both without and within, with clay. The chimnies were made in a corner, either of grey sand, a stone, or (in places where no stone was to be got) of mere clay, which they laid very thick in one corner of the house. The ovens for baking were likewise in the rooms. Formerly the *Swedes* had proper stables for the cattle ; but after the *English* came hither, and made no peculiar buildings for their cattle, the *Swedes* likewise left off making stables.

BEFORE the *English* came to settle here, the *Swedes* could not get as many cloaths as they

they wanted ; and were therefore obliged to make shift as well as they could. The men wore waistcoats and breeches of skins. Hats were not in fashion ; and they made little caps, provided with flaps before. They had worsted stockings. Their shoes were of their own making. Some of them had learnt to prepare leather, and to make common shoes, with heels ; but those who were not shoemakers by profession, took the length of their feet, and sewed the leather together accordingly ; taking a piece for the sole, one for the hind-quarters, and one more for the upper-leather. At that time, they likewise sowed flax here, and wove linen cloth. Hemp was not to be got ; and they made use of flaxen ropes and fishing tackle. The women were dressed in jackets and petticoats of skins. Their beds, excepting the sheets, were skins of several animals ; such as bears, wolves, &c.

TEA, coffee, and chocolate, which are at present universally in use here, were then* wholly unknown. Bread and butter, and other substantial food, was what they breakfasted upon ; and the above-mentioned superfluities have only been lately introduced, according to the account of the old *Swede*.

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* Before the *English* settled here.

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Sugar and treacle they had in abundance, as far as he could remember ; and rum formerly bore a more moderate price.

FROM the accounts of this old *Swede* I concluded, that before the *English* settled here, they followed wholly the customs of *Old Sweden* ; but after the *English* had been in the country for some time, the *Swedes* began gradually to follow their customs. When this *Swede* was but a boy, there were two *Swedish* smiths here, who made hatchets, knives, and scythes, exactly like the *Swedish* ones, and made them sharper than they can be got now. The hatchets now in use are in the *English* way, with a broad edge ; and their handles are very narrow. Almost all the *Swedes* made use of baths ; and they commonly bathed every *Saturday*. They celebrated *Christmas* with several sorts of games, and with several peculiar dishes, as is usual in *Sweden* ; all which is now, for the greatest part, left off. In the younger years of this *Swede*, they made a peculiar kind of carts here. They sawed thick pieces of liquid-amber trees, and made use of two of them for the foremost wheels, and of two more for the hindmost. With those carts they brought home their wood. Their sledges were at that time

time made almost in the same manner as they are now, or about as broad again as the true *Swedish* ones. Timber and great beams of wood were carried upon a dray. They baked great loaves, such as they do now. They had never any biscuit, though the clergymen, who came from *Sweden*, commonly got some baked.

THE *English* on their arrival here bought large tracts of land of the *Swedes*, at a very inconsiderable price. The father of the old *Swede* sold an estate to the *English*, which at this time would be reckoned worth three hundred pounds, for which he got a cow, a sow, and a hundred gourds.

WITH regard to the decrease of birds, the number of them and fish, he was wholly of that opinion which I have already mentioned *. This was the account which the old man gave me of the former state of the *Swedes* in this country. I shall speak more particularly of it in the sequel.

HURRICANES are sometimes very violent here, and often tear up great trees. They sometimes proceed as it were in peculiar tracts, or lines. In some places, especially in the hurricane's tract, all the trees

* See vol. I. page 289.

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trees are struck down, and it looks as if the woods were cut down designedly ; but close to the tract the trees receive no hurt. Such is the place which was shewn to me to-day. It is dangerous to go into the woods where the hurricanes blow ; for the trees fall before one has time to guard himself, or make the least provision for his security.

THE *Pennsylvanian Asp* was now in full blossom. But neither this tree, nor those near a-kin to it, shewed their leaves.

AN old countryman asserted that he commonly sowed a bushel of rye, on an acre of ground, and got twenty bushels in return ; but from a bushel of barley he got thirty bushels. However in that case the ground must be well prepared. Wheat returns about as much as rye. The soil was a clay mixed with sand and mould.

IN the evening I returned*.

MARCH the 28th. I FOUND a black beetle† (*Scarabæus*) with a pentagonal oval

* From Nils Gustafson, the old Swede.

† The beetle here described, seems to be the *Scarabæus Carolinus*, Linn. Syst. Nat. p. 545, and of Drury Illustrations of Nat. Hist. tab. 35. f. 2. It is common in New York, New Jersey, Pennsylvania, Maryland, and Carolina. F.

oval *Chypeus* or shield, on the head a short blunt horn, and a gibbous, or hump-backed *Thorax*, or Corselet. This beetle is one of the bigger sort here. I found here and there holes on the hills, which were so wide that I could put my finger into them. On digging them up I always found these beetles lying at the bottom, about five inches under ground. Sometimes there were short whitish worms, about as thick as one's finger, which lay with the beetles; and perhaps they were related to them. There were likewise other insects in such holes, as, a black cricket (*Gryllus campestris*)? spiders, earth-beetles (*Carabi*), and others. This beetle had a scent exactly like the *Trifolium melilotus cærulea*, or the blue melilot. It was entirely covered with oblong pale ticks (*Acari*). Its feet were as strong as those of the common *Dung-chaffer* (*Scarabæus stercorarius*).

April the 4th. A *Cicindela*, or shining beetle, with a gold-green head, thorax, and feet, and a blue green abdomen or belly, flew every where about the fields, and was hunting other insects. It is very common in *North America*, and seems to be a mere variety of the *Cicindela campestris*.

CIMEX lacustris, a kind of *Water-bugs*,
5 hopped

hopped in numbers on the surface of waters which had a slow course.

DYTISCUS piceus, or, the great *Water-beetle*, swam sometimes in the water.

ABOUT sixty years ago, the greatest part of this country was covered with tall and thick trees, and the swamps were full of water. But it has undergone so great a change, as few other places have undergone, in so short a time. At present the forests are cut down in most places, the swamps drained by ditches, the country cultivated, and changed into corn-fields, meadows, and pastures. Therefore, it seems very reasonable to suppose, that so sudden a change has likewise had some effect upon the weather. I was therefore desirous of hearing from the old *Swedes*, who have lived the longest in this country, and have been inhabitants of this place during the whole time of the change mentioned, whether the present state of the weather was in some particulars remarkably different from that which they felt in their younger years? The following is an account which they all unanimously gave me in answer to this question.

THE winter came sooner formerly than it does now. Mr *Isaac Norris*, a wealthy merchant, who has a considerable share in the

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the government of *Pensylvania*, confirmed this by a particular account. His father, one of the first *English* merchants in this country, observed, that in his younger years, the river *Delaware* was commonly covered with ice, about the middle of *November*, old style, so that the merchants were obliged to bring down their ships in great haste before that time, for fear of their being obliged to ly all winter. On the contrary, this river seldom freezes over at present, before the middle of *December*, old stile.

It snowed much more in winter, formerly, than it does now ; but the weather in general was likewise more constant and uniform ; and when the cold set in, it continued to the end of *February*, or till *March*, old style, when it commonly began to grow warm. At present, it is warm, even the very next day after a severe cold ; and sometimes the weather changes several times a day.

MOST of the old people here were of opinion, that spring came much later at present, than formerly, and that it was now much colder in the latter end of *February*, and the whole month of *May*, than when they were young. Formerly the

the fields were as green, and the air as warm, towards the end of *February*, as it is now in *March*, or in the beginning of *April*, old stile. The *Swedes* at that time made use of this phrase: *Pask bitida, Pask sent, altid Gras*, that is, we have always grass at *Easter*, whether it be soon or late in the year. But perhaps we can account as follows, for the opinion which the people here have, that vegetation appeared formerly more forward than it does now. Formerly the cattle were not so numerous as now; however, the woods were full of grass and herbs, which, according to the testimony of all the old people here, grew to the height of a man. At present a great part of the annual grasses and plants have been entirely extirpated by the continual grazing of numbers of cattle. These annual grasses were probably green very early in spring, and (being extirpated) might lead the people to believe, that every thing came on sooner formerly, than it does at present.

It used to rain more abundantly than it does now; during the harvest especially, the rains fell in such plenty, that it was very difficult to bring home the hay and corn. Some of the last years had been extremely dry. However, a few people were

of opinion that it rained as plentifully at present, as formerly.

ALL the people agreed, that the weather was not by far so inconstant, when they were young, as it is now. For at present it happens at all times of the year, that when a day has been warm, the next is very cold, and *vice versa*. It frequently happens that the weather alters several times in one day; so that when it has been a pretty warm morning, the wind blows from N. W. about ten o'clock, and brings a cold air with it; yet a little after noon it may be warm again. My meteorological observations sufficiently confirm the reality of these sudden changes of weather, which are said to cause in a great measure the people to be more unhealthy at present, than they were formerly.

I likewise found every body agree in asserting, that the winter, betwixt the autumn of the year 1697, and the spring of the year 1698, was the coldest and the severest which they had ever felt.

April the 6th. *SANGUINARIA Canadensis*, which is here called *Blood-root*, because the root is great and red, and, when cut, looks like the root of red beet, and the *Epigæa repens*, which some call the *creeping ground Laurel*, were both beginning to flower.

flower. The former grew in a rich mould, the other in a poorer soil.

THE *Laurus æstivalis*, which some people call *Spice-wood*, likewise began to blossom about this time; its leaves were not yet broke out; it liked a moist soil in the woods.

April the 9th. *APOCYNUM Cannabinum* was by the *Swedes* called *Hemp of the Indians*; * and grew plentifully in old corn-grounds, in woods, on hills, and in high glades. The *Swedes* have given it the name of *Indian hemp*, because the *Indians* formerly, and even now, apply it to the same purposes as the *Europeans* do hemp; for the stalk may be divided into filaments, and is easily prepared. When the *Indians* were yet settled among the *Swedes*, in *Pensylvania* and *New Jersey*, they made ropes of this *Apocynum*, which the *Swedes* bought, and employed them as bridles, and for nets. These ropes were stronger, and kept longer in water, than such as were made of common hemp. The *Swedes* commonly got fourteen yards of these ropes for one piece of bread. Many of the *Europeans* still buy such ropes, because they last so well. The *Indians* likewise make several other stuffs of their hemp. On my journey through

* *Wilke Hampa*.

the country of the *Iroquesé*, I saw the women employed in manufacturing this hemp. They made use neither of spinning-wheels nor distaffs, but rolled the filaments upon their bare thighs, and made thread and strings of them, which they dyed red, yellow, black, &c. and afterwards worked them into stuffs, with a great deal of ingenuity. The plant is perennial, which renders the annual planting of it altogether unnecessary. Out of the root and stalk of this plant, when it is fresh, comes a white milky juice, which is somewhat poisonous. Sometimes the fishing tackle of the *Indians* consists entirely of this hemp. The *Europeans* make no use of it, that I know of.

FLAX and *Cat-tail*, were names given to a plant which grows in bays, rivers, and in deep whirlpools, and which is known to botanists by the name of *Typha latifolia*. Its leaves are here twisted together, and formed into great oblong rings, which are put upon the horse's neck, between the mane and the collar, in order to prevent the horse's neck from being hurt by the collar. The bottoms of chairs were frequently made of these leaves, twisted together. Formerly the *Swedes* employed the wool or cotton which surrounds its seeds, and put it into their beds, instead of feathers;

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thers; but as it coalesces into lumps after the beds have been used for some time, they have left off making use of them. I omit the use of this plant in physic, it being the peculiar province of the physicians.

A SPECIES of *Leek**, very like that which appears only in woods on hills in *Sweden*, grows at present on almost all corn-fields mixed with sand. The *English* here called it *Garlick*. On some fields it grew in great abundance. When the cattle grazed on such fields, and ate the garlick, their milk, and the butter which was made of it, tasted so strongly of it, that they were scarce eatable. Sometimes they sold butter in the *Philadelphia* markets, which tasted so strongly of garlick that it was entirely useless. On this account, they do not suffer milking cows to graze on fields where garlick abounds: this they reserve for other species of cattle. When the cattle eat much of this garlick in summer, their flesh has likewise such a strong flavour, that it is unfit for eating. This kind of garlick appears early in spring; and the horses always passed by it, without ever touching it.

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* *Allium arvense*; odore gravi, capitulis bulbosis rubentibus. See Gronov. *Flora Virginica*, 37. This Leek seems to be Dr. Linnæus's *Allium Canadense*, scapo nudo tereti, foliis linearibus, capitulo bulbifero. *Spec. plant.* l. p. 431. F.

IT would take too much room in my Journal, and render it too prolix, were I to mark down the time when every wild plant in this country was in blossom, when it got ripe seeds, what soil was peculiar to it, besides other circumstances. Some of my readers would be but little amused with such a botanical digression. I intend therefore to reserve all this for another work, which will give a particular account of all the plants of *North America*; and I shall only mention such trees and plants here, which deserve to be made known for some peculiar quality.

April the 12th. THIS morning I went to *Philadelphia* and the places adjacent, in order to know whether there were more plants lately sprung up, than at *Raccoon*, and in *New Jersey* in general. The wet weather which had happened the preceding days, had made the roads very bad in low and clayey places.

THE leaves which dropt last autumn had covered the ground, in depth three or four inches. As this seems to hinder the growth of the grass, it was customary to burn it in *March* or at the end of that month, (according to the old stile) in order to give the grass the liberty of growing up. I found several spots burnt in this manner to-day;

to-day; but if it be useful one way, it does a great deal of damage in another; all the young shoots of several trees were burnt with the dead leaves, which diminishes the woods considerably; and in such places where the dead leaves had been burnt for several years together, the old trees only were left, which being cut down, there remains nothing but a great field, without any wood. At the same time all sorts of trees and plants are consumed by the fire, or at least deprived of their power of budding; a great number of the plants, and most of the grasses here, are annual; their seeds fall between the leaves, and by that means are burnt: This is another cause of universal complaint, that grass is much scarcer at present in the woods than it was formerly; a great number of dry and hollow trees are burnt at the same time, though they could serve as fuel in the houses, and by that means spare part of the forests. The upper mould likewise burns away in part by that means, not to mention several other inconveniences with which this burning of the dead leaves is attended. To this purpose the government of *Pensylvania* have lately published an edict, which prohibits this burning; nevertheless every one did as he pleased,

and this prohibition met with a general censure.

THERE were vast numbers of *Woodlice* in the woods about this time; they are a very disagreeable insect, for as soon as a person sits down on an old stump of a tree, or on a tree which is cut down, or on the ground itself, a whole army of *Woodlice* creep upon his clothes, and insensibly come upon the naked body. I have given a full account of their bad qualities, and of other circumstances relating to them, in the *Memoirs of the Swedish Royal Academy of Sciences*. See the Volume for the year 1754, page 19.

I HAD a piece of petrified wood given me to-day, which was found deep in the ground at *Raccoon*. In this wood the fibres and inward rings appeared very plainly; it seemed to be a piece of hiccory; for it was as like it, in every respect, as if it had but just been cut from a hiccory-tree.

I LIKEWISE got some shells to-day which the *English* commonly call *Clams*, and whereof the *Indians* make their ornaments and money, which I shall take an opportunity of speaking of in the sequel. These *Clams* were not fresh, but such as are every where found in *New Jersey*, on digging deep into the ground; the live shells of
this

this kind are only found in salt water, and on the sea coasts. But these *Clams* were found at *Raccoon*, about eight or nine *English* miles from the river *Delaware*, and near a hundred from the nearest sea-shore.

At night I went to Mr *Bartram's* seat.

April the 13th. I employed this day in several observations relative to Botany.

Two nests of wasps hung in a high maple-tree, over a brook. Their form was wholly the same with that of our wasp-nests, but they exceeded them in size. Each nest was ten inches in diameter; in each nest were three cakes, above one another, of which the lowermost was the biggest, and the two uppermost decreased in proportion: there were some eggs of wasps in them. The diameter of the lowest cake was about six inches, and one quarter, and that of the uppermost, three inches, and three quarters. The cells in which the eggs or the young ones were deposited were hexagonal, and the colour of the nest grey. I was told, that the wasps make this kind of nests out of the grey splints, which stick to old pales and walls. A dark brown bee, with black *antennæ*, and two black rings on the belly, and purple wings, flew about the trees, and might perhaps be an inhabitant of these nests.

ANOTHER

ANOTHER kind of wasps, which are larger than these, make their nests quite open. It consists merely of one cake, which has no covering, and is made of the boughs of trees. The cells are horizontal, and when the eggs or the young *larvæ* ly in them, they have lids or coverings, that the rain may not come into them. But whither the old wasps retreat during storms, is a mystery to me, except they creep into the crevices of rocks. That side of the cake which is uppermost is covered with some oily particles, so that the rain cannot penetrate. The cells are hexagonal, from five to seven lines deep, and two lines in diameter. Mr. *Bartram* observed, that these nests are built of two sorts of materials, viz. the splints which are found upon old pales, or fences, and which the wind separates from them; for the wasps have often been observed to sit on such old wood, and to gnaw away these splints; the sides and the lid or cover of the cells are made of an animal substance, or glutinous matter, thrown up by the wasps, or prepared in their mouths; for when this substance is thrown into the fire, it does not burn, but is only singed, like hair or horn. But the bottom of the nest being put into the fire, burns like li-
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men or half-rotten wood, and leaves a smell of burnt wood. The wasps, whose nests I have now described, have three elevated black shining points on the forehead †, and a pentagonal black spot on the thorax. Towards the end of autumn these wasps creep into the cavities of mountains, where they ly torpid during winter. In spring, when the sun begins to operate, they come out during day-time, but return towards night, when it grows cold. I saw them early in spring during sunshine, in and about some cavities in the mountains. I was told of another species of wasps, which make their nests under ground.

GYRINUS natator (Americanus), or the *Whirl-beetles*. These were found dancing in great numbers on the surface of the waters.

April the 14th. *THIS* morning I went down to *Chester*: in several places on the road are saw-mills, but those which I saw to-day had no more than one saw. I like-
wise

† These three points are common to most insects, and ought therefore not to be made characteristics of any particular species. They are called *Stemmata*, and are a kind of eyes which serve the insects for looking at distant objects, as the compound eyes do for objects near at hand. F.

wife perceived that the woods and forests of these parts had been very roughly treated. It is customary here, when they erect saw-mills, wind-mills, or iron works, to lead the water a good way lower, in case the ground near a fall in the river is not convenient for building upon.

April the 16th. THIS morning I returned to *Raccoon*. This country has several kinds of swallows, viz. such as live in barns, in chimneys, and under ground; there are likewise martens.

The *Barn Swallows*, or *House Swallows* are those with a furcated tail. They are *Linnaeus's Hirundo rustica*. I found them in all the parts of *North America* which I travelled over. They correspond very nearly to the *European House Swallow* in regard to their colour, however there seems to be a small difference in the note. I took no notice this year when they arrived: but the following year, 1750, I observed them for the first time on the 10th of *April* (new style); the next day in the morning, I saw great numbers of them sitting on posts and planks, and they were as wet as if they had been just come out of the sea*. They build

* It has been a subject of contest among naturalists, to determine the winter-retreat of *Swallows*. Some think, they

build their nests in houses, and under the roofs on the outside ; I likewise found their nests

they go to warmer climates when they disappear in the Northern countries : others say, they creep into hollow trees, and holes in clefts of rocks, and ly there all the winter in a torpid state : and others affirm, that they take their retreat into water, and revive again in spring. The two first opinions have been proved, and it seems have found credit ; the last has been treated as ridiculous, and almost as an old woman's tale. Natural history, as all the other histories, depends not always upon the intrinsic degree of probability, but upon fact founded on the testimony of people of noted veracity.—*Swallows* are seldom seen sinking down into the water, *Swallows* have not such organs as frogs or lizards, which are torpid during winter, *ergo*, *Swallows* live not, and cannot live, under water.—This way of arguing, I believe, would carry us, in a great many cases, too far ; for tho' it is not clear to every one, it may however be true : and lizards and frogs are animals of a class widely different from that of birds, and must therefore of course have a different structure ; hence it is they are classed separately. The bear and the marmot are in winter in a torpid state, and have however not such organs as lizards and frogs ; and no body doubts of their being, during some time, in the most rigid climates in a torpid state : for the *Alpine Nations* hunt the marmots frequently, by digging their holes up, and find them so torpid, that they cut their throats, without their reviving or giving the least sign of life during the operation ; but when the torpid marmot is brought into a warm room and placed before the fire, it revives from its lethargy. The question must therefore be decided by facts ; nor are they wanting here : Dr. *Wallerius*, the celebrated *Swedish* Chemist, wrote in 1748, *September* the 6th O. S. to the late Mr. *Klein*, Secretary of the City of *Dantzick* : " That he has seen more than once *Swallows* assembling on a reed, till they were all immersed and went to the bottom ; this being preceded by a dirge of a quarter of an hour's length. He attests likewise, that he had seen a *Swallow* caught during winter out of a lake with a net, drawn,

nefts built on mountains and rocks whose top projected beyond the bottom ; they build

drawn, as is common in Northern countries, under the ice : this bird was brought into a warm room, revived, fluttered about, and soon after died."

Mr. Klein applied to many *Fermiers generaux* of the King of Prussia's domains, who had great lakes in their districts, the fishery in them being a part of the revenue ; in winter the fishery thereon is the most considerable under the ice, with nets spreading more than 200 or 300 fathoms, and they are often wound by screws and engines, on account of their weight. All the people questioned made affidavits upon oath before the magistrates. *First*, The mother of the Countess *Lebendorf* said, that she had seen a bundle of *Swallows* brought from the *Frisch-Haff* (a lake communicating with the *Baltic* at *Pillau*) which when brought into a moderately warm room, revived and fluttered about. *Secondly*, Count *Schlieben* gave an instrument on stamped paper, importing, that by fishing on the lake belonging to his estate of *Gerdauen* in winter, he saw several *Swallows* caught in the net, one of which he took up with his hand, brought it into a warm room, where it lay about an hour, when it began to stir, and half an hour after it flew about in the room. *Thirdly*, Fermier general (*Amtman*) *Witkowski* made affidavit, that in the year 1740, three *Swallows* were brought up with the net in the great pond at *Didlacken* ; in the year 1741, he got two *Swallows* from another part of the pond, and took them home, (they all being caught in his presence) ; after an hour's space they revived all in a warm room, fluttered about, and died three hours after. *4thly*, *Amtman Bönke* says, that having had the estate *Kleskow* in farm, he had seen nine *Swallows* brought up in the net from under the ice, all which he took into a warm room, where he distinctly observed how they gradually revived ; but a few hours after they all died. Another time his people got likewise some *Swallows* in a net, but he ordered them again to be thrown into the water. *5thly*, *Andrew Rutta*, a master fisherman, at *Olefsko*, made affidavit, 1747, that 22 years ago, two *Swallows*

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Swallows

Swallows were taken up, by him, in a net, under the ice, and being brought into a warm room, they flew about. 6thly, *Jacob Kosulso*, a master fisherman, at *Stradaun*, made affidavit, that in 1736, he brought up in winter, in a net, from under the ice of the lake at *Raski*, a seemingly dead *Swallow*, which revived in half an hour's time, in a warm room, and he saw, a quarter of an hour after, the bird grow weaker, and soon after dying. 7thly, I can reckon myself among the eye-witnesses of this paradoxon of natural history. In the year 1735, being a little boy, I saw several *Swallows* brought in winter by fishermen, from the river *Vistula*, to my father's house, where two of them were brought into a warm room, revived, and flew about. I saw them several times settling on the warm stove, (which the Northern nations have in their rooms) and I recollect well that the same forenoon they died, and I had them, when dead, in my hand.

In the year 1754, after the death of my uncle *Godefroy Wolf*, captain in the *Polish* regiment of foot guards; being myself one of his heirs, I administered for my co-heirs. several estates called the *Starosty*, of *Dirschau*, in *Polish Prussia*, which my late uncle farmed under the king. In January the lake of *Lybschau*, belonging to these estates, being covered with ice, I ordered the fishermen to fish therein, and in my presence several *Swallows* were taken; which the fishermen threw in again; but one I took up myself, brought it home, which was five miles from thence, and it revived, but died about an hour after its reviving. These are facts, attested by people of the highest quality, by some in public offices, and by others, who, tho' of a low rank, however made these affidavits upon oath. It is impossible to suppose indiscriminately that they were prompted by views of interest, to assert as a fact, a thing which had no truth in it. It is therefore highly probable, or rather incontestably true, that *Swallows* retire in the Northern countries during winter, into the water, and stay there in a torpid state, till the return of warmth revives them

Swallows made their nests, before the *Europeans* settled and built houses here; for it is well known that the huts of the *Indians* could not serve the purpose of the *Swallows*. A very creditable lady and her children told me the following story, assuring me that they were eye-witnesses to it: A couple of *Swallows* built their nest in the stable belonging to the lady; the female

Swallow

them again in spring. The question therefore I believe ought for the future to be thus stated: The swallows in *Spain, Italy, France*, and perhaps some from *England*, remove to warmer climates; some *English* ones, and some in *Germany* and other mild countries, retire into clefts and holes in rocks, and remain there in a torpid state. In the colder northern countries the *Swallows* immerse in the sea, in lakes, and rivers, and remain in a torpid state, under ice, during winter. There are still some objections to this latter assertion, which we must remove. It is said, Why do not rapacious fish, and aquatic quadrupeds and birds, devour these *Swallows*? The answer is obvious. *Swallows* chuse only such places in the water for their winter retreat, as are near reeds and rushes; so that sinking down there between them and their roots, they are by them secured against the rapaciousness of their enemies. But others object, Why are not these birds caught in such waters as are continually harrassed by nets? I believe the same answer which has been made to the first objection, will serve for this likewise. Fishermen take care to keep off with their nets from places filled with reeds and rushes, for fear of entangling and tearing their nets; and thus the situation of *Swallows* under water, is the reason that they are seldom disturbed in their silent winter-retreats. What confirms this opinion still more is, that *Swallows* were never caught in *Prussia*, according to the above-mentioned affidavits,
but

Swallow sat upon the nest, laid eggs in it, and was about to brood them; some days after, the people saw the female still sitting on the eggs: but the male flying about the nest and sometimes settling on a nail, was heard to utter a very plaintive note, which betrayed his uneasiness: on a nearer examination the female was found dead in the nest, and the people flung her away. The

but with those parts of the net which passed near to the reeds and rushes; and sometimes the *Swallows* were yet fastened with their feet to a reed, when they were drawn up by the net. As to the argument taken from their being so long under water without corruption, I believe, there is a real difference between animals suffocated in water, and animals being torpid therein. We have examples of things being a long time under water; to which we may add the intense cold of these northern regions, which preserves them. Who would have thought it, that snails and polypes may be dissected, and could reproduce the parts severed from their body, if it was not a fact? Natural history ought to be studied as a collection of facts; not as the history of our guesses or opinions. Nature varies in an infinite manner; and Providence has diversified the instinct of animals, and their œconomy, and adapted it to the various seasons and climates. This long digression I thought necessary and excusable; and the more so, as the ingenious great friends to the cause of Natural History, the late Mr. *Collinson*, and Mr. *Pennant*, have both asserted the impossibility and improbability of this immersion. I revere the memory and the ashes of the one, and think the friendship of the other an honour to me: but am assured, that both prefer truth to their private opinion; and can bear a modest opposition, when it is proposed with candour, with a view to promote truth, and with sentiments of respect and gratitude, as it is done by me, in the present case. F.

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male

male then went to sit upon the eggs, but after being about two hours on them, and thinking the business too troublesome for him, he went out, and returned in the afternoon with another female, which sat upon the eggs, and afterwards fed the young ones, till they were able to provide for themselves. The people differed here in their opinions about the abode of *Swallows* in winter: most of the *Swedes* thought that they lay at the bottom of the sea; some, with the *English* and the *French* in *Canada*, thought that they migrate to the southward in autumn, and return in spring. I have likewise been credibly informed in *Albany*, that they have been found sleeping in deep holes and clefts of rocks, during winter.

THE *Chimney Swallows* are the second species, and they derive their name from building their nests in chimneys, which are not made use of in summer: sometimes when the fire is not very great, they do not mind the smoke, and remain in the chimney. I did not see them this year till late in *May*, but in the ensuing year, 1750, they arrived on the 3d of *May*, for they appear much later than the other *Swallows*. It is remarkable that each feather in their tail ends in a stiff sharp point, like the end of an awl; they apply the tail to the side of
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the wall in the chimneys, hold themselves with their feet, and the stiff tail serves to keep them up : they make a great thundering noise all the day long, by flying up and down in the chimneys ; and as they build their nests in chimneys only, and it is well known that the *Indians* have not so much as a hearth made of masonry, much less a chimney, but make their fires on the ground in their huts, it is an obvious question, Where did these *Swallows* build their nests before the *Europeans* came, and made houses with chimneys ? It is probable that they formerly made them in great hollow trees. This opinion was adopted by Mr. *Bartram*, and many others here. *Catesby* has described the *Chimney Swallow* and figured it*, and Dr. *Linnaeus* calls it *Hirundo Pelasgia*.

THE *Ground Swallows* or *Sand Martins*, (*Linnaeus's Hirundo riparia*) are to be met with every where in *America* ; they make their nests in the ground on the steep shores of rivers and lakes.

THE *Purple Martins* have likewise been described and drawn in their natural colours by *Catesby*†. Dr. *Linnaeus* likewise calls them *Hirundo purpurea*. They are less common here than the former species ; I

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have

* *Hirundo, caudâ aculeatâ, Americana.* *Catesb. Carol. vol. iii. t. 8.*

† *Hirundo purpurea.* *Nat. Hist. of Carol. vol. i. t. 51.*

have seen in several places little houses made of boards, and fixed on the outside of the walls, on purpose that these *Martins* may make their nests in them ; for the people are very desirous of having them near their houses, because they both drive away hawks and crows as soon as they see them, and alarm the poultry by their anxious note, of the approach of their enemies. The chickens are likewise used to run under shelter, as soon as they are warned by the *Martins*.

April the 17th. THE *Dirca palustris*, or *Moufe-wood*, is a little shrub which grows on hills, towards swamps and marshes, and was now in full blossom. The *English* in *Albany* call it *Leather-wood*, because its bark is as tough as leather. The *French* in *Canada* call it *Bois de Plomb*, or *Leaden-wood*, because the wood itself is as soft and as tough as lead. The bark of this shrub was made use of for ropes, baskets, &c. by the *Indians*, whilst they lived among the *Swedes*. And it is really very fit for that purpose, on account of its remarkable strength and toughness, which is equal to that of the *Lime-tree* bark. The *English* and the *Dutch* in many parts of *North America*, and the *French* in *Canada*, employ this bark in all cases, where

where we make use of *Lime-tree* bark in *Europe*. The tree itself is very tough, and you cannot easily separate its branches without the help of a knife: some people employ the twigs for rods.

April the 20th. THIS day I found the *Strawberries* in flower, for the first time, this year: the fruit is commonly larger than that in *Sweden*; but it seems to be less sweet and agreeable.

The annual harvest, I am told, is always of such a nature, that it affords plenty of bread for the inhabitants, though it turns out to greater advantage in some years than it does in others. A venerable septuagenary *Swede*, called *Aoke Helm*, assured me, that in his time no absolutely barren crop had been met with, but that the people had always had pretty plentiful crops. It is likewise to be observed, that the people eat their bread of maize, rye, or wheat, quite pure and free from the inferior kinds of corn, and clear of husks, stalks, or other impurities. Many aged *Swedes* and *Englishmen* confirmed this account, and said, that they could not remember any crop so bad as to make the people suffer in the least, much less that any body was starved to death, whilst they were in *America*. Sometimes the price of

corn rose higher in one year than in another, on account of a great drought or bad weather, but still there was always corn sufficient for the consumption of the inhabitants. Nor is it likely that any great famine can happen in this country, unless it please God to afflict it with extraordinary punishments. The weather is well known, from more than sixty years experience. Here are no cold nights which hurt the germ. The wet is of short continuance, and the drought is seldom or never of long duration. But the chief thing is the great variety of corn. The people sow the different kinds, at different times and seasons, and though one crop turn out bad, yet another succeeds. The summer is so long, that of some species of corn they may get three crops. There is hardly a month from *May* to *October* or *November*, inclusive, in which the people do not reap some kind of corn, or gather some sort of fruit. It would indeed be a very great misfortune if a bad crop should happen; for here, as in many other places, they lay up no stores, and are contented that there is plenty of food for the present exigencies.

THE Peach-trees were now every where in blossom; their leaves were not yet come out of the buds, and therefore the
flowers

flowers shewed to greater advantage; their beautiful pale red colour had a very fine effect; and they sat so close that the branches were entirely clad with them. The other fruit-trees were not yet in flower; however the apple-blossoms began to appear.

THE *English* and the *Swedes* of *America* give the name of *Currants* † to a shrub which grows in wet ground, and near swamps, and which was now in blossom; its flowers are white, have a very agreeable fragrantcy, and grow in oblong bunches; the fruit is very good eating, when it is ripe; the *style* (*Stylus*) is thread-shaped (*filiformis*), and shorter than the *Stamina*; it is divided in the middle, into five parts, or *Stigmata*. Dr. *Linnaeus* calls it *Crataegus* *, and Dr. *Gronovius* calls it a *Mespilus* ‡.

April the 22d. THE *Swedes* give the name of *Whipperiwill*, and the *English* that of *Whip-poor-will*, to a kind of nocturnal bird, whose voice is heard in *North America*, almost throughout the whole night. *Catesby* and *Edwards* both have described

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and

† It must be carefully distinguished from what is called *Currants*, in *England*, which is the *Ribes rubrum*. F.

* *Crataegus tomentosa*, Linn. Spec. Pl. p. 682.

‡ *Mespilus inermis*, foliis ovato-oblongis, serratis, subtus tomentosis. Gronov. Fl. Virgin. 55.

and figured it *. Dr. *Linnaeus* calls it a variety of the *Caprimulgus Europæus*, or *Goat-sucker*: its shape, colour, size, and other qualities, make it difficult to distinguish them from each other. But the peculiar note of the *American* one distinguishes it from the *European* one, and from all other birds: it is not found here during winter, but returns with the beginning of summer. I heard it to-day, for the first time, and many other people said, that they had not heard it before this summer; its *English* and *Swedish* name is taken from its note; but, accurately speaking, it does not call *Whipperiwill*, nor *Whip-poor-will*, but rather *Whipperiwhip*, so that the first and last syllables are accented, and the intermediate ones but slightly pronounced. The *English* change the call of this bird into *Whip-poor-will*, that it may have some kind of signification: it is neither heard nor seen in day-time; but soon after sunset it begins to call, and continues for a good while, as the cuckow does in *Europe*. After it has continued calling in a place for some time, it removes to another, and begins again: it commonly comes several times

* *Caprimulgus minor Americanus*. *Catesb. Nat. Hist. of Carolina*, Vol. iii. t. 16. *Edwards's Nat. Hist. of Birds*, t. 63.

times in a night, and settles close to the houses; I have seen it coming late in the evening, and settling on the steps of the house, in order to sing its song; it is very shy, and when a person stood still, it would settle close by him, and begin to call. It came to the houses in order to get its food, which consists of insects; and those always abound near the houses at night; when it sat and called its *whipperiwhip*, and saw an insect passing, it flew up and caught it, and settled again. Sometimes you hear four or five, or more, near each other, calling as it were for a wager, and raising a great noise in the woods. They were seldom heard in towns, being either extirpated there, or frightened away, by frequent shooting. They do not like to sit on trees, but are commonly on the ground, or very low in bushes, or on the lower poles of the enclosures. They always fly near the ground: they continue their calling at night till it grows quite dark; they are silent till the dawn of day comes on, and then they call till the sun rises. The sun seems to stop their mouths, or dazzle their eyes, so as to make them sit still. I have never heard them call in the midst of night, though I hearkened very attentively, on purpose to hear it; and

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and many others have done the same. I am told they make no nest, but lay two eggs in the open fields. My servant shot at one which sat on a bush near the house, and though he did not hit it, yet it fell down through fear, and lay for some time quite dead; but recovered afterwards. It never attempted to bite when it was held in the hands, only endeavouring to get loose by stirring itself about. Above, and close under the eyes, were several black, long, and stiff bristles, as in other nocturnal birds. The *Europeans* eat it. Mr. *Catesby* says, the *Indians* affirm, that they never saw these birds, or heard of them, before a certain great battle, in which the *Europeans* killed a great number of *Indians*. Therefore, they suppose that these birds, which are restless, and utter their plaintive note at night, are the souls of their ancestors who died in battle.

April the 24th. TO-DAY the *Cherry-trees* began to shew their blossoms; they had already pretty large leaves.

THE *Apple-trees* likewise began to blossom; however the *Cherry-trees* were more forward: They likewise got a greenish hue from their leaves.

THE *Mulberry-trees* * were yet quite naked;

* *Morus rubra.*

ked ; and I was sorry to find that this tree is one of the latest in getting leaves, and one of the first which gets fruit.

April the 26th. THIS morning I travelled to *Penn's Neck*. The *Tulip-trees*, especially the tall ones, looked quite green, being covered with their leaves ; this tree is therefore one of the earliest which get leaves.

TO-DAY I saw the flowers of the *Sassafras-tree*, (*Laurus Sassafras*). The leaves were not yet come out. The flowers have a fine smell.

THE *Lupinus perennis* is abundant in the woods, and grows equally in good soil and in poor. I often found it thriving on very poor sandy fields, and on heaths, where no other plants will grow. Its flowers, which commonly appear in the middle of *May*, make a fine shew by their purple hue. I was told, that the cattle eat these flowers very greedily ; but I was sorry to find very often that they were not so fond of it, as it is represented, especially when they had any thing else to eat ; and they seldom touched it notwithstanding its fine green colour, and its softness : The horses eat the flowers, but leave the stalks and leaves. If the cattle eat this plant in spring, necessity and hunger give it a relish. This

country does not afford any green pastures like the *Swedish* ones; the woods are the places where the cattle must collect their food. The ground in the woods is chiefly flat, or with very little risings. The trees stand far asunder; but the ground between them is not covered with green sods; for there are but few kinds of grasses in the woods, and they stand single and scattered. The soil is very loose, partly owing to the dead leaves which cover the ground during a great part of the year. Thus the cattle find very little grass in the woods, and are forced to be satisfied with all kinds of plants which come in their way, whether they be good or bad food. I saw for some time this spring, that the cattle bit off the tops and shoots of young trees, and fed upon them; for no plants were yet come up, and they stand in general but very thin, and scattered here and there, as I have just mentioned. Hence you may easily imagine that hunger compels the cattle to eat plants, which they would not touch, were they better provided for. However, I am of opinion, that it would be worth while to make use of this *Lupine* to mend dry sandy heaths, and, I believe, it would not be absolutely impossible to find out the means of making it agreeable to the cattle.

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THE *Oaks* here have similar qualities with the *European* ones. They keep their dead leaves almost during the whole winter, and are very backward in getting fresh ones; they had no leaves as yet, and were but just beginning to shew a few.

THE *Humming-bird*, which the *Swedes* call *King's-bird**, and which I have mentioned in a former volume, appeared hereabouts to-day, for the first time this spring.

NUMBERS of *Oil beetles*, (*Meloe Proscarabæus*) sat on the leaves of white *Hellebore*, (*Veratrum album*) and feasted on them. I considered them a great while, and they devoured a leaf in a few minutes. Some of them had already eaten so much that they could hardly creep. Thus this plant, which is almost certain death to other animals, is their dainty food.

THE *Fire-flies* appeared at night, for the first time this year, and flew about between the trees, in the woods. It seemed, in the dark, as if sparks of fire flew up and down. I will give a more particular account of them in another place.

TOWARDS night I went to *Raccoon*.

May the 1st. THE last night was so cold that the ground at sun-rising was as white

* *Kungsfogel*.

white as snow, from the hoary frost. The *Swedish* thermometer was a degree and a half below the freezing point. We observed no ice in the rivers or waters of any depth; but upon such only as were about three inches deep, the ice lay to the thickness of one third part of a *line* *. The evening before, the wind was south, but the night was calm. The apple-trees and cherry-trees were in full blossom. The peach-trees were almost out of flower. Most of the forest-trees had already got new and tender leaves, and most of them were in flower, as almost all kinds of oaks, the dog-wood, (*Cornus Florida*), hiccory, wild prunes, sassafras, horn-beam, beeches, &c.

THE plants which were found damaged by the frost, were the following. 1. The *Hiccory*. Most of the young trees of this kind had their leaves killed by the frost, so that they looked quite black in the afternoon; the leaves were consumed by frost every where in the fields, near the marshes, and in the woods. 2. The *black Oak*. Several of these trees had their leaves damaged by the frost. 3. The *white Oak*. Some very young trees of this kind had lost their leaves

* The tenth part of an inch.

leaves by the frost. 4. The blossoms of the *Cherry-trees* were hurt in several places. 5. The flowers of the *English Walnut-tree* were entirely spoiled by the frost. 6. The *Rhus glabra*. Some of these trees had already got leaves, and they were killed by the cold. 7. The *Rhus radicans*; the tender young trees of this kind suffered from the frost, and had their leaves partly killed. 8. The *Thalictra*, or *Meadow Rues*, had both their flowers and leaves hurt by the frost. 9. The *Podophyllum peltatum*. Of this plant there was not above one in five hundred hurt by the frost. 10. The *Ferns*. A number of them, which were lately come up, were destroyed. I must add several plants which were likewise hurt, but which I could not distinguish, on account of their smallness.

I went to several places this day.

THE *Bartia coccinea* grew in great abundance on several low meadows. Its flower-buds were already tinged with their precious scarlet, and adorned the meadows. It is not yet applied to any use, but that of delighting the sight.

ONE of the *Swedes* here had planted an *English* walnut-tree (*Juglans regia*) in his garden, and it was now about three yards high; it was in full blossom, and had already

already great leaves, whereas the black walnut-trees, which grow spontaneously in every part of this country, had not yet any leaves, or flowers. The last night's frost had killed all the leaves of the *European* kind. Dr. Franklin told me afterwards, that there had been some *English* walnut-trees in *Philadelphia*, which came on very well ; but that they were killed by the frost.

I looked about me for the trees which had not yet got fresh leaves, and I found the following ones :

Juglans nigra, or the *Black Walnut-tree*.

Fraxinus excelsior, or the *Ash*.

Acer Negundo, called the *White-ash* here.

Nyssa aquatica, the *Tupelo-tree*.

Diospyros Virginiana, or the *Persimon*.

Vitis Labrusca, or the *Fox-grapes* ; and

Rhus glabra, or the *Sumach*.

The trees whose leaves were coming out, were the following :

Morus rubra, the *Mulberry-tree*.

Fagus Castanea, the *Chestnut-tree*.

Platanus occidentalis, or the *Water-beech*.

Laurus Sassafras, the *Sassafras-tree*.

Juglans alba, the *Hicory*. Some trees of this kind had already large leaves, but others had none at all ; the same difference,

I believe,

I believe, exists likewise among the other species of hickory.

THE *Virginian Cherry-tree* grows here and there, in the woods and glades: its leaves were already pretty large; but the flowers were not yet entirely open.

THE *Sassafras-tree* was now every where in flower; but its leaves were not yet quite disclosed.

THE *Liquidambar Styraciflua* or *Sweet Gum-tree*, grows in the woods, especially in wet soil, in and near purling rivulets: its leaves were now already sprouting out at its summit. This tree grows to a great thickness, and its height rivals that of the tallest firs and oaks; as it grows higher, the lower branches die and drop, and leave the stem at last quite smooth and strait, with a great crown at the very summit; the seeds are contained in round, dentated cones, which drop in autumn; and as the tree is very tall, so the high winds carry the seeds away to a great distance. I have already given an account of the use of this tree in the first volume, to which I must add the following account.

THE wood can be made very smooth, because its veins are extremely fine: but it is not hard; you can carve letters on it with a knife, which will seem to be en-

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graved. Mr. *Lewis Evans* told me, from his own experience, that no wood in this country was more fit for making moulds for casting brads in, than this. I enquired of Mr. *Bartram*, "Whether he had found the rosin on this tree, which is so much praised in physic." He told me, "That a very odoriferous rosin always flows out of any cut or wound, which is made in the tree; but that the quantity here was too inconsiderable to recompense the labour of collecting it." This odoriferous rosin or gum first gave rise to the *English* name. The further you go to the *South*, the greater quantity of gum does the tree yield, so that it is easy to collect it. Mr. *Bartram* was of opinion, that this tree was properly calculated for the climate of *Carolina*, and that it was brought by several ways so far North as *New York*. In the southern countries the heat of the Sun fills the tree with gum, but in the northern ones it does not.

May the 2d. THIS morning I travelled down to *Salem*, in order to see the country.

THE *Sassafras-tree* stood single in the woods, and along the fences, round the fields: it was now distinguishable at a distance for its fine flowers, which being now quite

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quite open, made it look quite yellow. The leaves were not yet come out.

IN some meadows the grass was already grown up pretty high : but it is to be observed, that these meadows were marshy, and that no cattle had been on them this year. These meadows are mown twice a year, viz. in *May*, and the end of *August*, or beginning of *August*, old style. I saw some meadows of this kind to-day, in which I saw grass which was now almost fit to be mown ; and many meadows in *Sweden* have not such grass at the proper time of mowing, as these had now ; these meadows lay in marshes and vallies, where the Sun had very great power : the grass consisted merely of *Cyperus-grass* or *Carex*.

THE wild *Prune-trees* were now every where in flower ; they grow here and there in the woods, but commonly near marshes and in wet ground ; they are distinguishable by their white flowers : the fruit when ripe is eatable.

THE *Cornus Florida*, or *Dogwood*, grows in the forests, on hills, on plains, in vallies, in marshes, and near rivulets. I cannot therefore say, which is its native soil ; however, it seems that in a low but not a wet soil it succeeds best ; it was now adorned with its great snowy *Involucra*;

which render it conspicuous even at a distance. At this time it is a pleasure to travel through the woods, so much are they beautified by the blossoms of this tree. The flowers which are within the *Involucra* began to open to-day. The tree does not grow to any considerable height or thickness, but is about the size of our *Mountain Ash* (*Sorbus aucuparia*). There are three species of this tree in the woods; one with great white *Involucra*, another with small white ones, and a third with reddish ones.

THE woods were now full of birds: I saw the lesser species every where hopping on the ground, or creeping in bushes, without any great degree of shiness; it is therefore very easy for all kinds of snakes to approach and bite them. I believe that the rattlesnake has nothing to do but to ly still, and without waiting long, some little bird or other will pass by or run directly upon her, giving her an opportunity of catching it, without any enchantment.

SALEM is a little trading town, situated at some distance from the river *Delaware*. The houses do not stand far asunder, and are partly stone, and partly wood. A rivulet passes by the town, and falls into the *Delaware*. The inhabitants live by their several trades, as well as they can. In the neigh-

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neighbourhood of *Salem* are some very low and swampy meadows ; and therefore it is reckoned a very unwholesome place. Experience has shewn, that those who came hither from other places to settle, got a very pale and sickly look, though they arrived in perfect health, and with a very lively colour. The town is very easily distinguished about this time, by the disagreeable stench which arises from the swamps. The vapours of the putrid water are carried to those inhabitants which live next to the marshes ; and enter the body along with the air, and through the pores, and thus are hurtful to health. At the end of every summer, the intermitting fevers are very frequent. I knew a young couple, who came along with me from *England* to *America* : soon after their arrival at *Philadelphia*, they went to *Salem*, in perfect health ; but a few weeks after they fell sick, and before the winter was half over they were both dead.

MANY of the inhabitants plant *Saffron* ; but it is not so good and so strong as the *English* and *French Saffron*. Perhaps it grows better by being laid up for some years, as tobacco does.

THE *Gossypium herbaceum*, or Cotton plant, is an annual plant ; and several of the inhabitants of *Salem* had began to sow it.

Some had the seeds from *Carolina*, where they have great plantations of cotton; but others got it out of some cotton which they had bought. They said, it was difficult, at first, to get ripe seeds from the plants which were sown here; for the summer in *Carolina*, from whence their first seed came, is both longer and hotter than it is here. But after the plants have been more used to the climate, and hastened more than they were formerly, the seeds are ripe in due time.

AT night I returned to *Raccoon*.

May the 4th. CRAB-TREES are a species of wild apple trees, which grow in the woods and glades, but especially on little hillocks, near rivers*. In *New Jersey* the tree is rather scarce; but in *Pennsylvania* it is plentiful. Some people had planted a single tree of this kind near their farms, on account of the fine smells which its flowers afford. It had begun to open some of its flowers about a day or two ago; however, most of them were not yet open. They are exactly like the blossoms of the common apple-trees, except that the colour is a little more reddish in the *Crab-trees*; though some kinds of the cultivated trees have
flowers

* *Pyrus coronaria*. Linn. Sp. Plant, p. *Malus sylvestris*, *floribus odoratis*. Gronov. Fl. Virginica, 55.

flowers which are very near as red : but the smell distinguishes them plainly ; for the wild trees have a very pleasant smell, somewhat like the rasp-berry. The apples, or crabs, are small, sour, and unfit for any thing but to make vinegar of. They ly under the trees all the winter, and acquire a yellow colour. They seldom begin to rot before spring comes on.

I CANNOT omit an observation here. The *Crab-trees* opened their flowers only yesterday and to-day ; whereas, the cultivated apple-trees, which are brought from *Europe*, had already lost their flowers. The wild cherry-trees did not flower before the 12th of *May* ; on the other hand, the cultivated or *European* ones, had already opened their blossoms on the 24th of *April*. The black walnut-trees of this country had neither leaves nor flowers, when the *European* kind has large leaves and blossoms. From hence it appears, that trees brought over from *Europe*, of the same kind with the wild trees of *America*, flower much sooner than the latter. I cannot say what is the reason of this forwardness of the *European* trees in this country, unless they bring forth their blossoms as soon as they get a certain degree of warmth, which they have in their native country. It seems, the *Eu-*

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ropean trees do not expect, after a considerable degree of warmth, any such cold nights as will kill their flowers; for, in the cold countries, there seldom happen any hot days succeeded by such cold nights as will hurt the flowers considerably. On the contrary, the wild trees in this country are directed by experience, (if I may so speak) not to trust to the first warmth; but they wait for a greater heat, when they are already safe from cold nights. Therefore, it happens often, that the flowers of the *European* trees are killed by the frosts here; but the native trees are seldom hurt, though they be of the same kind with the *European* ones. This is a manifest proof of the wisdom of the Creator.

May the 5th. EARLY this morning I went to *Rapaapo*, which is a great village, whose farms ly all scattered. It was inhabited merely by *Swedes*, and not a single *Englishman*, or people of any other nation, lived in it: therefore they have preserved their native *Swedish* tongue, and mixed but few *English* words with it. The intention of my journey was partly to see the place, and to collect plants and other natural curiosities there; and partly to find the places where the *White Cedar*, or *Cupressus thyoides*, grows.

THE *Mayflowers*, as the *Swedes* call them, were plentiful in the woods where-ever I went to-day ; especially on a dry soil, or one that is somewhat moist. The *Swedes* have given them this name, because they are in full blossom in *May*. Some of the *Swedes* and the *Dutch* call them *Pinxterbloem*, (*Whitsunday flowers*), as they really are in blossom about *Whitsuntide*. The *English* call them *Wild Honeysuckles* ; and at a distance they have some similarity to the *Honeysuckle*, or *Lonicera*. Dr. *Linnaeus*, and other botanists, call it an *Azalea**. Its flowers were now open, and added a new ornament to the woods, being little inferior to the flowers of the honeysuckle and *Hedysarum*. They sit in a circle round the stem's extremity, and have either a dark red or a lively red colour ; but, by standing for some time, the sun bleaches them, and at last they get a whitish hue. I know not why *Colden* calls them yellow†. The height of the bush is not always alike. Some were as tall as a full grown man, and taller, others were but low, and some were not above a palm from the ground ; yet they were

* *Azalea nudiflora*. Linn. Spec. Plant. p. 214. *Azalea ramis infra flores nudis*. Gron. Virg. 21.

† *Azalea erecta, foliis ovatis, integris, alternis, flore luteo, piloso, præcoci*. Cold. Ebor. 25.

were all full of flowers. The people have not yet found that this plant may be applied to any use; they only gather the flowers, and put them in pots, because they are very shewy. They have some smell; but I cannot say it is very pleasant. However, the beauty of the colour entitles them to a place in every flower-garden.

TO-DAY I saw the first ear of this year's rye. In *Sweden*, rye begins to shew its ears about *Ericmas*, that is, about the 18th of *May*, old stile*. But in *New Sweden*, the people said, they always saw the ears of rye in *April*, old stile; whether the spring begins late or early. However, in some years the ears come early, and in others late, in *April*. This spring was reckoned one of the late ones.

BULLFROGS† are a large species of frogs, which I had an opportunity of hearing and seeing to-day. As I was riding out, I heard a roaring before me; and I thought it was a bull in the bushes, on the other side of the dyke, though the sound was rather more hoarse than that of a bull. I was however afraid, that a bad goring bull might be near me, though I did not see him;

* Accordingly about the 29th of *May*, new stile.

† *Rana boans*. Linn. Syst. 1. p. 358. *Rana maxima, Americana, aquatica*. Cat. Carol. II. 72.

him; and I continued to think so till some hours after, when I talked with some *Swedes* about the *Bullfrogs*, and, by their account, I immediately found that I had heard their voice; for the *Swedes* told me, that there were numbers of them in the dyke. I afterwards hunted for them. Of all the frogs in this country, this is doubtless the greatest. I am told, that towards autumn, as soon as the air begins to grow a little cool, they hide themselves under the mud, which lies at the bottom of ponds and stagnant waters, and ly there torpid during winter. As soon as the weather grows mild, towards summer, they begin to get out of their holes, and croak. If the spring, that is, if the mild weather, begins early, they appear about the end of *March*, old stile; but if it happens late, they tarry under water till late in *April*. Their places of abode are ponds, and bogs with stagnant water; they are never in any flowing water. When many of them croak together, they make an enormous noise. Their croak exactly resembles the roaring of an ox or bull, which is somewhat hoarse. They croak so loud, that two people talking by the side of a pond cannot understand each other. They croak all together; then stop a little, and begin again. It seems as if they had a captain

tain among them : for when he begins to croak, all the others follow ; and when he stops, the others are all silent. When this captain gives the signal for stopping, you hear a note like *poop* coming from him. In day-time they seldom make any great noise, unless the sky is covered. But the night is their croaking time ; and, when all is calm, you may hear them, though you are near a mile and a half off. When they croak, they commonly are near the surface of the water, under the bushes, and have their heads out of the water. Therefore, by going slowly, one may get close up to them before they go away. As soon as they are quite under water, they think themselves safe, though the water be very shallow.

SOMETIMES they sit at a good distance from the pond ; but as soon as they suspect any danger, they hasten with great leaps into the water. They are very expert at hopping. A full-grown *Bullfrog* takes near three yards at one hop. I have often been told the following story by the old *Swedes*, which happened here, at the time when the *Indians* lived with the *Swedes*. It is well known, that the *Indians* are excellent runners ; I have seen them, at Governor *Johnsen's*, equal the best horse in its swiftest course,

course, and almost pass by it. Therefore, in order to try how well the bull-frogs could leap, some of the *Swedes* laid a wager with a young *Indian*, that he could not overtake the frog, provided it had two leaps before hand. They carried a bull-frog, which they had caught in a pond, upon a field, and burnt his back-side; the fire, and the *Indian*, who endeavoured to be closely up with the frog, had such an effect upon the animal, that it made its long hops across the field, as fast as it could. The *Indian* began to pursue the frog with all his might at the proper time: the noise he made in running frightened the poor frog; probably it was afraid of being tortured with fire again, and therefore it redoubled its leaps, and by that means it reached the pond before the *Indian* could over-take it.

IN some years they are more numerous than in others: nobody could tell, whether the snakes had ever ventured to eat them, though they eat all the lesser kinds of frogs. The women are no friends to these frogs, because they kill and eat young ducklings and goslings: sometimes they carry off chickens that come too near the ponds. I have not observed that they bite when they are held in the hands, though they have little teeth; when they are beaten, they cry

out

out almost like children. I was told that some eat the thighs of the hind legs, and that they are very palatable.

A TREE which grows in the swamps here, and in other parts of *America*, goes by the name of *White Juniper-tree*. Its stem indeed looks like one of our old tall and strait juniper-trees in *Sweden*: but the leaves are different, and the wood is white. The *English* call it *White Cedar*, because the boards which are made of the wood, are like those made of cedar. But neither of these names are just, for the tree is of the cypress kind *. It always grows in wet ground or swamps: it is therefore difficult to come to them, because the ground between the little hillocks is full of water. The trees stand both on the hillocks and in the water: they grow very close together, and have strait, thick, and tall stems; but they were greatly reduced in number to what they have been before. In such places where they are left to grow up, they grow as tall and as thick as the tallest fir-trees; they preserve their green leaves both in winter and summer; the tall ones have no branches on the lower part of the stem.

THE marshes where these trees grow are called *Cedar Swamps*. These cedar swamps are

* *Cupressus thyoides*. Linn. Spec. pl. p. 1422. *Cupressus Americana*, fructu minimo. *Miller's Gard. Dictionary*.

are numerous in *New Jersey*, and likewise in some parts of *Pensylvania* and *New York*. The most northerly place, where it has been hitherto found, is near *Goshen* in *New York*, under forty-one degrees and twenty-five minutes of north latitude, as I am informed by Dr. *Colden*. For to the North of *Goshen*, it has not been found in the woods. The white cedar is one of the trees, which resist the most to putrefaction; and when it is put above ground, it will last longer than under ground: therefore it is employed for many purposes; it makes good fences, and posts which are to be put into the ground; but in this point, the red cedar is still preferable to the white; it likewise makes good canoes. The young trees are employed for hoops round barrels, tuns, &c. because they are thin and pliable; the thick and tall trees afford timber, and wood for cooper's work. The houses which are built of it, surpass in duration, those which are built of *American* oak. Many of the houses in *Rapaapo* were made of this white cedar wood; but the chief thing which the white cedar affords is the best kind of shingles. The white cedar shingles are preferred to all others for several reasons; first, they are more durable than any others made of *American* wood, the red cedar shingles

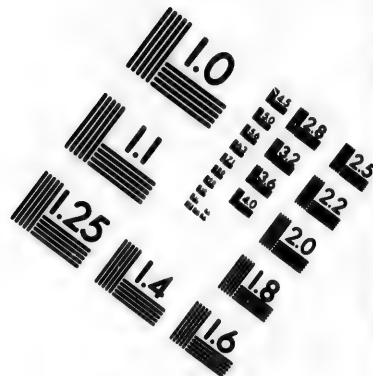
gles excepted ; secondly, they are very light, so that no strong beams are requisite to support the roof. For the same reason it is unnecessary to build thick walls, because they are not pressed by heavy roofs. When fires break out, it is less dangerous to go under or along the roofs, because the shingles being very light can do little hurt by falling ; they suck the water, being somewhat spongy, so that the roofs can easily be wetted in case of a fire : however, their fatness occasions that the water does not hurt them, but evaporates easily. When they burn and are carried about by the wind, they have commonly what is called a dead coal, which does not easily set fire where it alights. The roofs made of these shingles can easily be cut through, if required, because they are thin, and not very hard ; for these qualities the people in the country, and in the towns, are very desirous of having their houses covered with white cedar shingles, if the wood can be got. Therefore all churches, and the houses of the more substantial inhabitants of the towns, have shingle roofs. In many parts of *New York* province, where the white cedar does not grow, the people, however, have their houses roofed with cedar shingles, which they get from other parts. To that purpose great quantities of shingles are annually exported from *Eggharbour* and other

other parts of *New Jersey*, to the town of *New York*, from whence they are distributed throughout the province. A quantity of white cedar wood is likewise exported every year to the *West-Indies*, for shingles, pipe staves, &c. Thus the inhabitants are very busy here, not only to lessen the number of these trees, but even to extirpate them entirely. They are here (and in many other places) in regard to wood, bent only upon their own present advantage, utterly regardless of posterity. By this means many cedar swamps are already quite destitute of cedars, having only young shoots left; and I plainly observed, by counting the circles round the stem, that they do not grow up very quickly, but require a great deal of time before they can be cut for timber. It is well known that a tree gets only one circle every year; a stem, eighteen inches in diameter, had one hundred and eight circles round the thicker end; another, seventeen inches in diameter, had a hundred and sixteen; and another, two feet in diameter, had one hundred and forty-two circles upon it. Thus near eighty years growth is required, before a white cedar raised from seed can be used for timber. Among the advantages which the white cedar shingles have over others, the

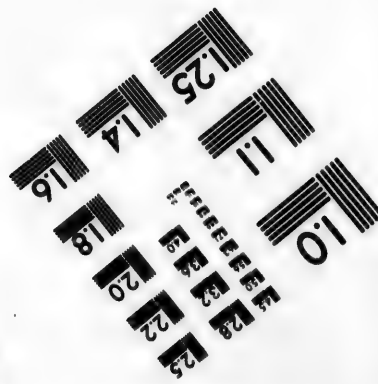
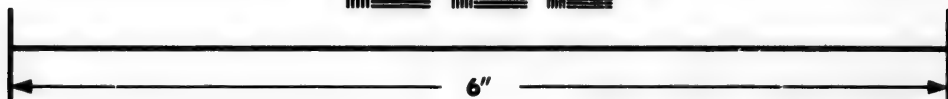
people reckon their lightness. But this good and useful quality may in future times turn out very disadvantageous to *Philadelphia*, and other places where the houses are roofed with cedar shingles; for as the roofs made of these shingles are very light, and bear but a trifling weight on the walls, so the people have made the walls but very thin. I measured the thickness of the walls of several houses here, of three stories high (cellar and garret not included), and found most of them nine inches and a half, and some ten inches thick; therefore it is by no means surprising, that violent hurricanes sometimes make the brick gable-ends to vibrate apparently, especially on such houses as have a very open situation. And since the cedar-trees will soon be wanting in this country, and the present roofs when rotten must be supplied with heavier ones, of tiles, or of other wood, it is more than probable, that the thin walls will not be able to bear such an additional weight, and will either break, or require to be supported by props: or else the whole house must be pulled down and rebuilt with thicker walls. This observation has already been made by others. Some of the people here make use of the chips of white cedar instead of tea, assuring me that they preferred it in
regard

regard to its wholesomeness to all foreign tea. All the inhabitants here were of opinion, that the water in the cedar swamps is wholesomer than any other drink: it creates a great appetite, which they endeavoured to prove by several examples. They ascribed this quality to the water itself, which is filled with the rosin of the trees, and to the exhalations which came from the trees, and can easily be smelled. The people likewise thought that the yellowish colour of the water, which stands between the cedar trees, was owing to the rosin, which comes out of the roots of these trees. They likewise all agreed, that this water is always very cold in the hottest season, which may be partly owing to the continual shade it is in. I knew several people who were resolved to go to these cedar swamps, and use the waters for the recovery of their appetite. Mr. *Bartram* planted a white cedar in a dry soil, but it could not succeed there: he then put it into a swampy ground, where it got as it were new life, and came on very well; and though it was not taller than a man, yet it was full of cones. Another thing is very remarkable, with regard to the propagation of this tree: Mr. *Bartram* cut its branches in spring two years successively, and put them into the swampy soil,





Resolution test chart showing patterns of vertical and horizontal lines with numerical values ranging from 1.0 to 4.0.



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where they struck roots, and succeeded very well. I have seen them myself.

THE *red Juniper-tree* is another tree which I have mentioned very frequently in the course of my account. The *Swedes* have given it the name of red Juniper, because the wood is very red and fine within. The *English* call it *red Cedar*, and the *French* *Cedre rouge*. However, the *Swedish* name is the most proper, as the tree belongs to the *Junipers**. At its first growth it has a deal of similarity to the *Swedish Juniper*†, but after it is grown up it gets quite different leaves. The berry exactly resembles that of the *Swedish Juniper*, in regard to its colour and shape; however, they are not so big, though the red *Cedar* grows very tall. At *Raccoon* these trees stood single, and were not very tall. But at other places I have seen them standing together in clusters; they like the same ground as the common *Swedish Juniper*, especially on the rising banks of rivers, and on other rising grounds, in a dry, and frequently in a poor soil. I have seen them growing in abundance, as thick and tall as the tallest fir-trees, on poor dry and sandy heaths. Towards *Canada*, or in the

* *Juniperus Virginiana*. Linn. Spec. pl. p. 114.

† *Juniperus communis*. Linn. Spec. pl. p. 1470.

the most northerly places, where I have seen them, they commonly choose the steep sides of the mountains, and there they grow promiscuously with the common *Juniper*. The most northerly places where I have found them wild in the woods, is in *Canada*, eighteen *French* miles to the southward of the Fort *Saint Jean*, or *St. John*, in about $44^{\circ} 35'$ North Latitude. I have likewise seen it growing very well in a garden, on the island of *Magdalene**, belonging to the then governor of *Montreal*, *Monsieur le Baron de Longueuil*. But it had been got at more southerly places, and was transplanted here. Of all the woods in this country, this is without exception the most durable, and withstands putrefaction longer than any other; it is therefore employed in all such cases where it is most liable to rot, especially for all kinds of posts which are to be put into the ground. Some people say, that if an iron be put into the ground along with a pole of cedar, the iron would be half corroded by rust in the same time that the wood would be rotten. In many places both the fences, and the posts belonging to them, are made

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of

* An island in the river *St. Lawrence*, close by the town of *Montreal*, in *Canada*.

of red cedar. The best canoes, consisting of a single piece of wood, are made of red cedar; for they last longer than any others, and are very light. In *New York* I have seen pretty large yachts build of red cedar. Several yachts which go from *New York* to *Albany*, up the river *Hudson*, are built in a different manner, as I have mentioned in the first volume*. In *Philadelphia* they cannot make any yachts or other boats of red cedar, because the quantity and the size of the trees will not allow of it. For the same reason they do not roof their houses with red cedar shingles; but in such places where it is plentiful, it makes excellent good roofs. The heart of this cedar is of a fine red colour, and whatever is made of it looks very fine, and has a very agreeable and wholesome smell. But the colour fades by degrees, or else the wood would be exceedingly proper for cabinet work. I saw a parlour in the country seat of Mr *Norris*, one of the Members of the *Pensylvanian* House of Assembly, wainscotted many years ago with boards of red cedar. Mr *Norris* assured me that the cedar

* See vol. I. page 115. The lower part of the yachts, which is continually under water, is made of black oak; the upper part is built of red cedar, because it is sometimes above and sometimes in the water.

cedar looked exceedingly well in the beginning, but it was quite faded when I saw it, and the boards looked very shabby, especially the boards near the window had entirely lost their colour; so that Mr *Norris* had been obliged to put mahogany in their stead: however, I was told, that the wood will keep its colour if a thin varnish is put upon it whilst it is fresh, and just after it has been planed, and if care is taken that the wood is not afterwards rubbed or hurt. At least it makes the wood keep its colour much longer than commonly. Since it has a very pleasant smell, when fresh, some people put the shavings and chips of it among their linen to secure it against being worm-eaten. Some likewise get bureaus, &c. made of red cedar, with the same view. But it is only useful for this purpose as long as it is fresh, for it loses its smell after some time, and is then no longer good for keeping off insects. It is sometimes sent to *England*, as timber, and sells very well. In many places round *Philadelphia*, in the seats of the gentry, there was commonly an avenue, with a row of these trees planted on both sides, leading from the high road to the house. The lower branches were cut, and only a fine crown left. In winter,

when most other trees have lost their leaves, this looks very fine. This tree has likewise a very slow growth; for a stem, thirteen inches and a quarter in diameter, had one hundred and eighty-eight rings, or annual circles, and another, eighteen inches in diameter, had at least two hundred and fifty, for a great number of the rings were so fine that they could not be counted. This tree is propagated in the same manner as the common Juniper-tree is in *Sweden*, viz. chiefly by birds, which eat the berries and emit the seeds entire. To encourage the planting of this useful tree, a description of the method of doing it, written by Mr *Bartram*, was inserted in a *Pennsylvania* almanack, called *Poor Richard Improved*, for the year 1749. In it was explained the manner of planting and augmenting the number of these trees, and mention is made of some of the purposes to which they may be employed.

IN the evening I returned to *Raccoon*.

May the 6th. THE Mulberry-trees (*Morus rubra*) about this time began to blossom, but their leaves were yet very small. The people divided them into male and female trees or flowers; and said that those which never bore any fruit were males, and those which did, females.

SMILAX

SMILAX *laurifolia* was superabundant in all the swamps near this place. Its leaves were now beginning to come out, for it sheds them all every winter; it climbs up along trees and shrubs, and runs across from one tree or bush to another: by this means it shuts up the passage between the trees, fastening itself every where with its cirrhi or tendrils, and even on people, so that it is with the utmost difficulty one must force a passage in the swamps and woods, where it is plentiful; the stalk towards the bottom is full of long spines, which are as strong as the spines of a rose-bush, and catch hold of the clothes, and tear them: this troublesome plant may sometimes bring you into imminent danger, when botanizing or going into the woods, for, not to mention that the cloaths must be absolutely ruined by its numberless spines, it occasions a deep shade in the woods, by crossing from tree to tree so often; this forces you to stoop, and even to creep on all fours through the little passages which are left close to the ground, and then you cannot be careful enough to prevent a snake (of which there are numbers here) from darting into your face. The stalk of the plant has the same colour as the young rose-bushes. It is quite green and

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MILAX

and smooth between the spines, so that a stranger would take it to be a kind of thorn-bush, in winter, when it is destitute of leaves.

May the 8th. THE trees hereabouts were now stocked with innumerable *Caterpillars*; one kind especially was observable, which is worse than all the others. They immediately formed great white webs, between the branches of the trees, so that they were perceptible, even at a distance; in each of these webs were thousands of *Caterpillars*, which crept out of them afterwards, and spread chiefly upon the apple-trees. They consumed the leaves, and often left not one on a whole branch. I was told, that some years ago they did so much damage, that the apple-trees and peach-trees hardly bore any fruit at all; because they had consumed all the leaves, and exposed the naked trees to the intense heat of the sun, by which means several of the trees died. The people took the following method of killing these *Caterpillars*: They fixed some straw or flax on a pole, set it on fire, and held it under the webs or nests; by which a part was burnt, and a part fell to the ground. However, numbers of the *Caterpillars* crept up the trees again, which could have been prevented, if they had been
trod

trod upon, or killed any other way. I called chickens to such places where they crept on the ground in numbers; but they would not eat them. Nor did the wild birds like them; for the trees were full of these webs, though whole flights of little birds had their nests in the gardens and orchards.

May the 18th. **THOUGH** it was already pretty late in *May*, yet the nights were very dark here. About an hour after sun-set, it was so dark, that it was impossible to read in a book, though the type was ever so large. About ten o'clock, on a clear night, the dark was so much increased, that it looked like one of the darkest star-light nights in autumn, in *Sweden*. It likewise seemed to me, that though the nights were clear, yet the stars did not give so great a light as they do in *Sweden*. And as, about this time, the nights are commonly dark, and the sky covered with clouds; so I would compare them only to dark and cloudy *Swedish* winter nights. It was therefore, at this time of the year, very difficult to travel in such cloudy nights; for neither man nor horse could find their way. The nights, in general, seem very disagreeable to me, in comparison to the light and glorious summer nights of *Sweden*. Ignorance sometimes makes us think slightly of our

our country. If other countries have their advantages, *Sweden* is not destitute of matter to boast of on this head : it likewise has its peculiar advantages ; and upon weighing the advantages and inconveniencies of different places, *Sweden* will be found to be not inferior to any of them.

I WILL briefly mention in what points I think *Sweden* is preferable to this part of *America* ; and why I prefer *Old Sweden* to *New Sweden*.

THE nights are very dark here all the summer ; and in winter, they are quite as dark, if not darker, than the winter nights in *Sweden* ; for here is no kind of *Aurora Borealis*, and the stars give a very faint light. It is very remarkable if an *Aurora Borealis* appears once or twice a year. The winters here bring no snow, to make the nights clear, and to make travelling more safe and easy. The cold is, however, frequently as intense as in *Old Sweden*. The snow which falls lies only a few days, and always goes off with a great deal of wet. The *Rattle-snakes*, *Horned-snakes*, *red-bellied*, *green*, and other poisonous *Snakes*, against whose bite there is frequently no remedy, are in great plenty here. To these I must add the wood-lice, with which the forests are so pestered, that it is impossible to pass through a bush without

out having a whole army of them on your cloaths, or to sit down, though the place be ever so pleasant. The inconvenience and trouble they cause, both to man and beast, I have described in the *Memoirs of the Royal Swedish Academy of Sciences*. The weather is so inconstant here, that when a day is most excessively hot, the next is often sensibly cold. This sudden change often happens in one day; and few people can suffer these changes, without impairing their health. The heat in summer is excessive, and the cold in winter often very piercing. However, one can always secure one's self against the cold; but when the great heat is of any duration, there is hardly any remedy against it. It tires one so, that one does not know which way to turn. It has frequently happened, that people who walked into the fields, dropped down dead, on account of the violence of the heat. Several distempers prevail here; and they increase every year. Nobody is left unattacked by the intermitting fever; and many people are forced to suffer it every year, together with other diseases. Pease cannot be sown, on account of the insects which consume them*. There are worms in the grains of rye, and numbers of them are in the cherry-trees.

* *Bruchus Fifi.*

trees. The caterpillars often eat all the leaves from the trees, so that they cannot bear fruit in that year; and numbers die every year, both of fruit-trees and forest-trees. The grass in the meadows is likewise consumed by a kind of worms, and another species cause the plumbs to drop, before they are half ripe. The oak here affords not near so good timber as the *European* oak. The fences cannot stand above eighteen years. The houses are of no long duration. The meadows are poor, and what grass they have is bad. The pasture for cattle in the forests, consists of such plants as they do not like, and which they are compelled to eat by necessity; for it is difficult to find a single grass in great forests, where the trees stand far asunder, and where the soil is excellent. For this reason, the cattle are forced, during almost the whole winter and part of the summer, to live upon the young shoots and branches of trees, which sometimes have no leaves: therefore, the cows give very little milk, and decrease in size every generation. The houses are extremely unfit for winter habitations. Hurricanes are frequent, which overthrow trees, carry away roofs, and sometimes houses, and do a great deal of damage. Some of these inconveniencies might be remedied by art; but

but others will either admit of no alteration, or they will at least cost vast trouble. Thus every country has its advantages, and its defects : happy is he who can content himself with his own.

THE rye grows very ill in most of the fields, which is chiefly owing to the carelessness in agriculture, and to the poorness of the fields, which are seldom or never manured. After the inhabitants have converted a tract of land into fields, which had been a forest for many centuries together, and which consequently had a very fine soil, they use it as such, as long as it will bear any corn; and when it ceases to bear any, they turn it into pastures for the cattle, and take new corn-fields in another place, where a fine soil can be met with, and where it has never been made use of for this purpose. This kind of agriculture will do for some time ; but it will afterwards have bad consequences, as every one may clearly see. A few of the inhabitants, however, treated their fields a little better : the *English* in general have carried agriculture to a higher degree of perfection than any other nation. But the depth and richness of the soil, which those found here who came over from *England*, (as they were preparing land for ploughing which had been covered with

with woods from times immemorial) misled them, and made them careless husbandmen. It is well known, that the *Indians* lived in this country for several centuries before the *Europeans* came into it ; but it is likewise known, that they lived chiefly by hunting and fishing, and had hardly any fields. They planted maize, and some species of beans and gourds ; and at the same time it is certain, that a plantation of such vegetables as serve an *Indian* family during one year, take up no more ground than a farmer in our country takes to plant cabbage for his family upon ; at least, a farmer's cabbage and turnep ground, taken together, is always as extensive, if not more so, than the corn-fields and kitchen-gardens of an *Indian* family. Therefore, the *Indians* could hardly subsist for one month upon the produce of their gardens and fields. Commonly, the little villages of *Indians* are about twelve or eighteen miles distant from each other. From hence one may judge, how little ground was formerly employed for corn-fields ; and the rest was overgrown with thick and tall trees. And though they cleared (as is yet usual) new ground, as soon as the old one had quite lost its fertility ; yet such little pieces as they made use of were very inconsiderable, when compared

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to the vast forests which remained. Thus the upper fertile soil increased considerably, for centuries together ; and the *Europeans* coming to *America* found a rich and fine soil before them, lying as loose between the trees as the best bed in a garden. They had nothing to do but to cut down the wood, put it up in heaps, and to clear the dead leaves away. They could then immediately proceed to ploughing, which in such loose ground is very easy ; and having sown their corn, they got a most plentiful harvest. This easy method of getting a rich crop has spoiled the *English* and other *European* inhabitants, and induced them to adopt the same method of agriculture which the *Indians* make use of ; that is, to sow uncultivated grounds, as long as they will produce a crop without manuring, but to turn them into pastures as soon as they can bear no more, and to take in hand new spots of ground, covered since time immemorial with woods, which have been spared by the fire or the hatchet ever since the creation. This is likewise the reason why agriculture, and the knowledge of this useful branch, is so imperfect here, that one can learn nothing on a great tract of land, neither of the *English*, nor of the *Swedes*, *Germans*, *Dutch*, and *French* ; except that, from their gross mis-

takes and carelessness for futurity, one finds opportunities every day of making all sorts of observations, and of growing wise at the expence of other people. In a word, the corn-fields, the meadows, the forests, the cattle, &c. are treated with equal carelessness; and the *English* nation, so well skilled in these branches of husbandry, is with difficulty found out here. We can hardly be more lavish of our woods in *Sweden* and *Finland* than they are here: their eyes are fixed upon the present gain, and they are blind to futurity. Every day their cattle are harassed by labour, and each generation decreases in goodness and size, by being kept short of food, as I have before mentioned. On my travels in this country I observed several plants, which the horses and cows preferred to all others. They were wild in this country, and likewise grew well on the driest and poorest ground, where no other plants would succeed. But the inhabitants did not know how to turn this to their advantage; owing to the little account made of Natural History, that science being here (as in other parts of the world) looked upon as a mere trifle, and the pastime of fools. I am certain, and my certainty is founded upon experience, that by means of these plants, in the space of a few years, I have
been

been able to turn the poorest ground, which would hardly afford food for a cow, into the richest and most fertile meadow, where great flocks of cattle have found superfluous food, and are grown fat upon. I own, that these useful plants were not to be found on the grounds of every planter : but with a small share of natural knowledge, a man would easily collect them in the places where they were to be got. I was astonished, when I heard the country people complaining of the badness of the pastures ; but I likewise perceived their negligence, and often saw excellent plants growing on their own grounds, which only required a little more attention and assistance from their unexperienced owners. I found every where the wisdom and goodness of the Creator ; but too seldom saw any acknowledgment, or adequate estimation of it, among men.

*O fortunatos nimium sua si bona norint
Agricolas !* VIRG. Georgic.

I HAVE been led to these reflections, which may perhaps seem foreign to my purpose, by the bad and neglected state of agriculture in every part of this continent. I likewise intended to shew the reason why this journal is so thinly stocked with æconomical advantages in the several branches of husbandry. I do not however deny, that I have sometimes found

one or two skilful œconomists, but they were very scarce.

BIRDS of prey which pursue the poultry are found in abundance here, and if possible more plentiful than in *Sweden*. They enjoy great liberty here, as there are still great forests in many places, from whence they can come unawares upon chickens and ducks. To the birds of prey it is quite indifferent whether the woods consist of good or bad trees, provided they are in shade. At night the owls, which are very numerous, endanger the safety of the tame fowls. They live chiefly in marshes, give a disagreeable shriek at night, and attack the chickens, which commonly roost at night in the apple-trees, peach-trees, and cherry-trees, in the garden. But since they are very busy in clearing this country of woods, as we are in *Sweden* and *Finland*, it may be of use for exposing the birds of prey, more than they are now, and for depriving them of the opportunities of doing mischief with so much ease.

THE thick forests of *America* contain numbers of stags; they do not seem to be a different species from the *European* stags. An *Englishman* was possessed of a tame hind. It is observable that though these creatures are very shy when wild in the woods

woods and the cedar swamps, which are very much frequented by them, yet they can be tamed to such a degree, if taken young, that they will come of their own accord to people, and even to strangers: This hind was caught when it was but very little; the colour of the whole body was a dirty reddish brown, the belly and the under side of the tail excepted, which were white; the ears were grey; the head, towards the snout, was very narrow, but upon the whole the creature looked very fine. The hair lay close together, and was quite short; the tail reached almost to the bend of the knee, near which, on the inside of each hind-foot, was a *knob* or *callus*. The possessor of the hind said, that he had tamed several stags, by catching them whilst they were very young. It was now big with young ones. It had a little bell hung about its neck, that by walking in the woods, the people might know it to be tame, and take care not to shoot it. It was at liberty to go where it pleased, and to keep it confined would have been a pretty hard task, as it could leap over the highest enclosures. Sometimes it went far into the woods, and frequently staid away a night or two, but afterwards returned home like other cattle.

When it went into the woods, it was often accompanied by wild stags, and decoyed them even into the very houses, especially in rutting time, giving its master numerous opportunities of shooting the wild stags, almost at his door. Its scent was excellent, and when it was turned towards the wind, I often saw it rising and looking towards that part, though I did not see any people on the road, but they commonly appeared about an hour after. As soon as the wild stags have the scent of a man, they make off. In winter the man fed the hind with corn and hay ; but in summer it went out into the woods and meadows, seeking its own food, eating both grafs and other plants : it was now kept in a meadow ; it did chiefly eat clover, the leaves of hiccory, of the *Andromeda paniculata*, and the *Geranium maculatum*. It was likewise contented with the leaves of the common plantane, or *Plantago*, grasses, and several other plants. The possessor of this hind sold stags to people in *Philadelphia*, who sent them as curiosities to other places. He got twenty-five, thirty, and forty shillings a-piece for them. The food of the wild stags in summer is grafs and several plants ; but in winter, when they are not to be got, they eat the shoots and young sprigs

sprigs of branches. I have already mentioned * that they eat without any danger the spoon-tree, or *Kalmia latifolia*, which is poison to other animals. In the long and severe winter, which commenced here upon the tenth of *December*, 1740, and continued to the thirteenth of *March*, old stile, during the course of which there fell a great quantity of snow, the stags were found dead in the snow, but chiefly higher up the country, where the snow was deeper. Nobody could determine whether their death was the consequence of the great quantity and depth of snow, which hindered their getting out, or whether the frost had been too severe, and of too long duration, or whether they were short of food. The old people likewise relate, that vast numbers of stags came down in the year 1705, when there was a heavy fall of snow, near a yard deep, and that they were afterwards found dead in the woods, in great numbers, because the snow was deeper than they could pass through. Numbers of birds were likewise found dead at that time. In that same winter, a stag came to *Matson* into the stables, and ate hay together with the cattle. It was so pinched by hunger, that it grew tame immediately, and did not run away

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* See vol. i. page 338.

from people. It afterwards continued in the house, as another tame creature. All aged persons asserted, that formerly this country abounded more with stags than it does at present. It was formerly not uncommon to see thirty or forty of them in a flock together. The reason of their decrease is chiefly owing to the increase of population, the destruction of the woods, and the number of people who kill and frighten the stags at present. However, high up in the country, in great forests and deserts, there are yet great numbers of them. Among their enemies is the *Lynx* of this country, which is the same with the *Swedish* one *. They climb up the trees, and when the stags pass by, they dart down upon him, get fast hold, bite, and suck the blood, and never give over till they have killed it.

I saw several holes in the ground, both on hills and on fields, and fallow grounds; they were round, and commonly about

* *Warglo*; *Felis Lynx*. Linn. The Swedes mention two kinds of lynx, the one is called the *Warglo*, or wolf-lynx, and the other the *Kattlo*, or cat-lynx. The Germans make the same distinction, and call the former *Wolf-luchs*, and the latter *Katz-luchs*: the former is the biggest, of a brownish red, mixed with grey and white, on its back, and white towards the belly, with brownish spots; the latter is smaller, and has a coat which is more white, and with more spots. F.

about an inch wide; they went almost perpendicularly into the earth, and were made by dung-beetles, or by great worms, which are made use of for angling. The dung-beetles had dug very deep into the ground, thro' horse-dung, tho' it lay on the hardest road, so that a great heap of earth lay near it. These holes were afterwards occupied by other insects, especially grasshoppers, (*Grylli*) and *Cicadae*; for by digging these holes up, I commonly found one or more young ones of these insects, which had not yet got their perfect size.

May the 19th. THIS morning I left *Raccoon*, a parish in the country called *New Sweden*, and which is yet chiefly inhabited by *Swedes*, in order to proceed in my travels to the North. I first intended to set out with the beginning of *April*, but for several reasons this was not adviseable. No leaves were come out at that time, and hardly any flowers appeared. I did not know what flowers grew here in spring; for the autumnal plants are different from the vernal ones. The *Swedes* had this winter told me the æconomical and medical uses of many plants, to which they gave names unknown to me: they could not then shew me those plants on account of the season, and by their deficient and erroneous descriptions,

scriptions, I was not able to guess what plants they meant. By going away so early as the beginning of *April*, I would have remained in uncertainty in regard to these things. It was therefore fit, that I should spend a part of the spring at *Raccoon*, especially as I had still time enough left for my tour to the North.

ON the road we saw a *Black Snake*, which we killed, and found just five foot long. *Catesby* has described it and its qualities, and also drawn it *. The full-grown Black Snakes are commonly about five feet long, but very slender; the thickest I ever saw was in the broadest part hardly three inches thick; the back is black, shining, and smooth; the chin white and smooth; the belly whitish turning into blue, shining, and very smooth; I believe there are some varieties of this snake. One which was nineteen inches long, had a hundred and eighty-six scales on the belly, (*Scuta Abdominalia*) and ninety-two half scales on the tail (*Squamæ subcaudales*), which I found to be true, by a repeated counting of the scales. Another, which was seventeen inches and a half in length, had a hundred and eighty-four scales on the belly, and only sixty-four half scales on the tail; this

I like-

* *Anguis niger*, See *Catesby's Nat. Hist. of Carol. ii. t. 48.*

I likewise assured myself of, by counting the scales over again. It is possible that the end of this last snake's tail was cut off, and the wound healed up again †.

THE country abounds with Black Snakes. They are among the first that come out in spring, and often appear very early if warm weather happens ; but if it grows cold again after that, they are quite frozen, and lie stiff and torpid on the ground or on the ice ; when taken in this state and put before a fire, they revive in less than an hour's time. It has sometimes happened, when the beginning of *January* is very warm, that they come out of their winter habitations. They commonly appear about the end of *March*, old style.

THIS

† It has been found by repeated experience, that the specific character employed by Dr. *Linnaeus*, for the distinction of the species of snakes, taken from their *Scuta abdominalia* & *caudalia*, or their *Squamæ subcaudales*, varies greatly in snakes of the same species, so that often the difference amounts to ten or more : the whole number of the scuta sometimes helps to find out the species ; care ought however to be taken, that the snake may not by any accident have lost its tail, and that it be growing again ; in which case, it is impossible to make use of this character. The character is not quite so good and decisive, as may be wished, but neither are the marks taken from colours, spots, stripes, &c. quite constant ; and so it is better to make use of an imperfect character, than none at all. Time, and greater acquaintance with this class of animals, may perhaps clear up their natural characters. F.

THIS is the swiftest of all the snakes which are to be found here, for it moves so quick, that a dog can hardly catch it. It is therefore almost impossible for a man to escape it if pursued: but happily its bite is neither poisonous nor any way dangerous; many people have been bit by it in the woods, and have scarce felt any more inconvenience than if they had been wounded by a knife; the wounded place only remains painful for some time. The Black Snakes seldom do any harm, except in spring, when they copulate; but if any body comes in their way at that time, they are so much vexed, as to pursue him as fast as they can. If they meet with a person who is afraid of them, he is in great distress. I am acquainted with several people, who have on such an occasion run so hard as to be quite out of breath, in endeavouring to escape the snake, which moved with the swiftness of an arrow after them. If a person thus pursued can muster up courage enough to oppose the snake with a stick or any thing else, when it is either passed by him, or when he steps aside to avoid it, it will turn back again, and seek a refuge in its swiftness. It is, however, sometimes bold enough to run directly upon a man, and not to depart before

fore it has received a good stroke. I have been assured by several, that when it overtakes a person, who has tried to escape it, and who has not courage enough to oppose it, it winds round his feet, so as to make him fall down; it then bites him several times in the leg, or whatever part it can get hold of, and goes off again. I shall mention two circumstances, which confirm what I have said. During my stay in *New York*, Dr. *Colden* told me, that in the spring, 1748, he had several workmen at his country seat, and among them one lately arrived from *Europe*, who of course knew very little of the qualities of the Black Snake. The other workmen seeing a great Black Snake copulating with its female, engaged the new comer to go and kill it, which he intended to do with a little stick. But on approaching the place where the snakes lay, they perceived him, and the male in great wrath leaves his pleasure to pursue the fellow with amazing swiftness; he little expected such courage in the snake, and flinging away his stick, began to run as fast as he was able. The snake pursued him, overtook him, and twisting several times round his feet, threw him down, and frightened him almost out of his senses; he could not get rid of the snake, till he took

took a knife and cut it through in two of three places. The other workmen were rejoiced at this sight, and laughed at it, without offering to help their companion. Many people at *Albany* told me of an accident which happened to a young lady, who went out of town in summer, together with many other girls, attended by her negro. She sat down in the wood, in a place where the others were running about, and before she was aware, a Black Snake being disturbed in its amours, ran under her petticoats, and twisted round her waist, so that she fell backwards in a swoon occasioned by her fright, or by the compression which the snake caused. The negro came up to her, and suspecting that a Black Snake might have hurt her, on making use of a remedy to bring his lady to herself again, he lifted up her cloaths, and really found the snake wound about her body as close as possible; the negro was not able to tear it away, and therefore cut it, and the girl came to herself again; but she conceived so great an aversion to the negro, that she could not bear the sight of him afterwards, and died of a consumption. At other times of the year this snake is more apt to run away, than to attack people. However I have heard it asserted frequently, that even in summer

when its time of copulation is past, it pursues people, especially children, if it finds that they are afraid and run from her. Several people likewise assured me from their own experience, that it may be provoked to pursue people, if they throw at it, and then run away. I cannot well doubt of this, as I have heard it said by numbers of creditable people; but I could never succeed in provoking them. I ran always away on perceiving it, or flung something at it, and then took to my heels, but I could never bring the snakes to pursue me: I know not for what reason they shunned me, unless they took me for an artful seducer.

Most of the people in this country ascribed to this snake a power of fascinating birds and squirrels, as I have described in several parts of my Journal *. When the snake lies under a tree, and has fixed his eyes on a bird or squirrel above; it obliges them to come down, and to go directly into its mouth. I cannot account for this, for I never saw it done. However, I have a list of more than twenty persons, among which are some of the most creditable people, who have all unanimously, though living

* See vol. i. p. 319.

living far distant from each other, asserted the same thing ; they assured me upon their honor, that they have seen (at several times) these Black Snakes fascinating squirrels and birds which sat on the tops of trees, the snake lying at the foot of the tree, with its eyes fixed upon the bird or squirrel, which sits above it, and utters a doleful note ; from which it is easy to conclude with certainty that it is about to be fascinated, though you cannot see it. The bird or squirrel runs up and down along the tree continuing its plaintive song, and always comes nearer the snake, whose eyes are unalterably fixed upon it. It should seem as if these poor creatures endeavoured to escape the snake, by hopping or running up the tree ; but there appears to be a power which withholds them : they are forced downwards, and each time that they turn back, they approach nearer their enemy, till they are at last forced to leap into its mouth, which stands wide open for that purpose. Numbers of squirrels and birds are continually running and hopping fearless in the woods on the ground, where the snakes ly in wait for them, and can easily give these poor creatures a mortal bite. Therefore it seems that this fascination might be thus interpreted, that the creature

creature has first got a mortal wound from the snake, which is sure of her bite, and lies quiet, being assured that the wounded creature has been poisoned with the bite, or at least feels pain from the violence of the bite, and that it will at last be obliged to come down into its mouth. The plaintive note is perhaps occasioned by the acuteness of the pain which the wound gives the creature. But to this it may be objected, that the bite of the Black Snake is not poisonous; it may further be objected, that if the snake could come near enough to a bird or squirrel to give it a mortal bite, it might as easily keep hold of it, or, as it sometimes does with poultry, twist round and strangle or strifle it. But the chief objection which lies against this interpretation, is the following account, which I received from the most creditable people, who have assured me of it. The squirrel being upon the point of running into the snake's mouth, the spectators have not been able to let it come to that pitch, but killed the snake, and as soon as it had got a mortal blow, the squirrel or bird destined for destruction, flew away, and left off their moanful note, as if they had broke loose from a net. Some say, that if they only touched the snake, so as to draw off

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its attention from the squirrel, it went off quickly, not stopping till it had got to a great distance. Why do the squirrels or birds go away so suddenly, and why no sooner? If they had been poisoned or bitten by the snake before, so as not to be able to get from the tree, and to be forced to approach the snake always more and more, they could however not get new strength by the snake being killed or diverted. Therefore, it seems that they are only *enchanted*, whilst the snake has its eyes fixed on them. However, this looks odd and unaccountable, though many of the worthiest and most reputable people have related it, and though it is so universally believed here, that to doubt it would be to expose one's self to general laughter.

THE black snakes kill the smaller species of frogs, and eat them. If they get at eggs of poultry, or of other birds, they make holes in them, and suck the contents. When the hens are sitting on the eggs, they creep into the nest, wind round the birds, stifle them, and suck the eggs. Mr. *Bartram* asserted, that he had often seen this snake creep up into the tallest trees, after bird's eggs, or young birds, always with the head foremost, when descending. A *Swede* told me, that a black

snake had once got the head of one of his hens in its mouth, and was wound several times round the body, when he came and killed the snake. The hen was afterwards as well as ever.

THIS snake is very greedy of milk, and it is difficult to keep it out, when it is once used to go into a cellar where milk is kept. It has been seen eating milk out of the same dish with children, without biting them, though they often gave it blows with the spoon upon the head, when it was overgreedy. I never heard it hissing. It can raise more than one half of its body from the ground, in order to look about her. It skins every year; and its skin is said to be a remedy against the cramp, if continually worn about the body.

THE rye was now beginning to flower.

I have often observed with astonishment, on my travels, the great difference between the plants and the soil, on the two opposite banks of brooks. Sometimes a brook, which one can stride over, has plants on one bank widely different from those on the opposite bank. Therefore, whenever I came to a great brook or a river, I expected to find plants which I had not met with before. Their seeds are carried down

with the stream from distant parts. The soil is likewise very often different on the different sides of a rivulet, being rich and fertile on the one, and dry, barren, and sandy on the other. But a great river can make still greater differences. Thus we see the great disparity between the province of *Pensylvania*, and *New Jersey*, which are only divided by the river *Delaware*. In *Pensylvania* the soil consists of a mould mixed with sand and clay, and is very rich and fertile: and in the woods which are higher in the country, the ground is mountainous and stony. On the other hand, in the province of *New Jersey*, the soil is poor and dry, and not very fertile, some parts excepted. You can hardly find a stone in *New Jersey*, and much less mountains. In *Pensylvania* you scarce ever see a fir-tree, and in *New Jersey* are whole woods of it.

THIS evening I arrived at *Philadelphia*.

May the 22d. THE locusts began to creep out of their holes in the ground last night, and continued to do so to-day. As soon as their wings were dry, they began their song, which is almost sufficient to make one deaf, when travelling through the woods. This year there was an immense number of them. I have given a
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minute account of them, of their food, qualities, &c. in the *Memoirs of the Swedish Royal Academy of Sciences* *; it is therefore needless to repeat it here, and I refer the reader to the quoted place.

May the 25th. The tulip-tree (*Liriodendron tulipifera*) was now in full blossom. The flowers have a resemblance to tulips, and look very fine, and though they have not a very agreeable smell, yet the eye is pleased to see trees as tall as full-grown oaks, covered with tulip-like flowers.

ON the flowers of the tulip-tree was an olive-coloured *Chaser* (*Scarabæus*) without horns (*muticus*), the suture and borders of his wing-shells (*Elytræ*) were black, and his thighs brown. I cannot with certainty say whether they collected the pollen of the flower, or whether they coupled. Later in summer, I saw the same kind of beetles make deep holes into the ripe mulberries, either to eat them, or to lay their eggs in them. I likewise found them abundant in the leaves of the *Magnolia glauca*, or beaver-tree.

THE straw-berries were now ripe on the hills.

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* See the volume for the year 1756, page 10, of the *Swedish* edition.

THE country people already brought ripe cherries up to town; but they were only a few to satisfy curiosity, yet we may form a judgment of the climate from hence.

May the 26th. A peculiar kind of storm called a *Travat*, or *Travado*, happened to-day. In the evening about ten o'clock, when the sky was quite clear, a thick, black cloud came rushing from the south-west, with a wind. The air was quite calm, and we could not feel any breeze. But the approach of this cloud was perceived from the strong rushing noise in the woods to the south-west, and which increased in proportion as the cloud came nearer. As soon as it was come up to us, it was attended by a violent gust of wind, which in its course threw down the weaker enclosures, carried them a good way along with it, and broke down several trees. It was then followed by a hard shower of rain, which put an end to the storm, and every thing was calm as before. These travadoes are frequent in summer, and have the quality of cooling the air. However, they often do a deal of damage. They are commonly attended by thunder and lightning; as soon as they are passed over, the sky is as clear as it was before.

May the 28th. THE *Magnolia glauca*
was

was now in full bloom. Its flowers have a very pleasant fragrancy, which refreshes the travellers in the woods, especially towards the evening. The flowers of the wild vine afterwards supplied the place of those of the Magnolia. Several other flowers contribute likewise towards perfuming the ambient air.

THE *Kalmia angustifolia* was now every where in flower. It grows chiefly on sandy heaths, or on dry poor grounds, which few other plants will agree with; it is common in *Pensylvania*, but particularly in *New Jersey*, and the province of *New York*, it is scarce in *Canada*; its leaves stay the winter; the flowers are a real ornament to the woods; they grow in bunches like crowns, and are of a fine lively purple colour; at the bottom is a circle of deep purple, and within it a greyish or whitish colour. The flowers grow as aforesaid, in bunches, round the extremity of the stalk, and make it look like a decorated pyramid. The *English* at *New York* call this plant the *Dwarf Laurel*. Its qualities are the same with those of the *Kalmia latifolia*, viz. that it kills sheep and other lesser animals, when they eat plentifully of it. I do not know whether it is noxious to the greater cattle. It is not of

any known use, and only serves to attract the eye whilst in flower.

THE *Kolmia latifolia* was likewise in full blossom at present. It rivals the preceding one, in the beauty of its colour; yet though they are conspicuous in regard to the colours and shape of their flowers, they are no ways remarkable for smell, such as the *Magnolia* is; for they have little or no smell at all. So equally and justly does nature distribute her gifts; no part of the creation has them all, each has its own, and none is absolutely without a share of them.

May the 30th. THE *Moravian Brethren*, who arrived in great numbers from *Europe*, at *New York*, in *May*, brought two converted *Greenlanders* with them. The *Moravians* who were already settled in *America*, immediately sent some of their brethren from *Philadelphia* to the new comers, in order to welcome them. Among these deputies were two *North American Indians*, who had been converted to their doctrine, and likewise two *South American Indians*, from *Surinam*. These three kinds of converted *Indians* accordingly met at *New York*. I had no opportunity of seeing them; but all those who had seen them, and whom I conversed with, thought that they

they had plainly perceived a similitude in their features and shape, the *Greenlanders* being only somewhat smaller. They concluded from hence, that all these three kinds of *Americans* were the posterity of one and the same descendant of *Noah*, or that they were perhaps yet more nearly related. How far their guesses are to be relied upon, I cannot determine.

RIPE cherries were now already pretty common, and consequently cheap.

YAMS are a species of roots, which are cultivated in the hottest parts of *America*, for eating, as we do potatoes. It has not yet been attempted to plant them here, and they are brought from the *West Indies* in ships; therefore they are reckoned a rarity here, and as such I ate them at Dr. *Franklin's* to-day. They are white, and taste like common potatoes, but not quite so agreeable; and I think it would not be worth while to plant them in *Sweden*, though they might bear the climate. The plant these roots belong to is the *Dioscorea alata*.

THE inhabitants make plenty of cheese. They are not reckoned so good as *English* cheese: however, some take them to be full as good when old; and so they seemed to me. A man from *Boston* in *New-England* told me, that they made very good cheese

cheese there : but they take care to keep the cattle from salt water, especially those who live near the sea-coasts ; for it has been found, that the cheese will not become so good when the cows graze near salt water, as it will when they have fresh water. This, however, wants nearer examination, in my opinion.

May the 31st. ABOUT noon I left *Philadelphia*, and went on board a small yacht, which sails continually up and down upon the river *Delaware*, between *Trenton* and *Philadelphia*. We sailed up the river with fair wind and weather. *Sturgeons* leaped often a fathom into the air. We saw them continuing this exercise all day, till we came to *Trenton*. The banks on the *Pennsylvanian* side were low ; and those on the *New Jersey* side steep and sandy, but not very high. On both sides we perceived forests of tall trees, with *deciduous* leaves.

DURING the course of this month, the forenoon was always calm ; but immediately after noon it began to blow gently, and sometimes pretty strongly. This morning was likewise fair ; and in the afternoon it was cloudy, but did not rain.

THE banks of the river were sometimes high, and sometimes low. We saw some small houses near the shore, in the woods ;
and,

and, now and then, a good house built of stone. The river now decreased visibly in breadth. About three o'clock this afternoon we passed *Burlington*.

BURLINGTON, the chief town in the province of *New Jersey*, and the residence of the governor, is but a small town, about twenty miles from *Philadelphia*, on the eastern side of the *Delaware*. The houses were chiefly built of stone, though they stood far distant from each other. The town has a good situation, since ships of considerable burden can sail close up to it: but *Philadelphia* prevents its carrying on an extensive trade; for the proprietors of that place* have granted it great immunities, by which it is increased so as to swallow all the trade of the adjacent towns. The house of the governor at *Burlington* is but a small one: it is built of stone, close by the river side, and is the first building in the town as you come from *Philadelphia*. It is observed, that about the full moons, when the tides are highest, and the high water at *Cape Hinlopen* comes at nine o'clock in the morning, it will be at *Chester*, on the river *Delaware*, about ten minutes after one o'clock; at *Philadelphia*, about ten minutes after two o'clock; and at *Burlington*,

* *William Pen*, Esq; and his heirs after him.

May 1749.

ton, about ten minutes after three o'clock; for the tide in the river *Delaware* comes quite up to *Trenton*. These observations were communicated to me by Mr. *Lewis Evans*.

THE banks of the river were now chiefly high and steep on the side of *New Jersey*, consisting of a pale brick-coloured soil. On the *Pennsylvanian* side, they were gently sloping, and consisted of a blackish rich mould, mixed with particles of Glimmer (*Mica*). On the *New Jersey* side appeared some firs; but seldom on the other, except in a few places where they were accidentally brought over from *New Jersey*.

TOWARDS night, after the tide had begun to ebb and the wind was quite subsided, we could not proceed, but dropped our anchor about seven miles from *Trenton*, and passed the night there. The woods were full of *Fireflies*, (*Lampyris*) which flew like sparks of fire between the trees, and sometimes across the river. In the marshes, the *Bullfrogs* now and then began their hideous roaring; and more than a hundred of them roared together. The *Whip-poor-will*, or *Goatsucker*, was likewise heard every where.

June the 1st. WE continued our voyage this morning, after the rain was over. The
river

river *Delaware* was very narrow here, and the banks the same as we found them yesterday, after we had passed *Burlington*. About eight o'clock in the morning we arrived at *Trenton**.

June the 2d. THIS morning we left *Trenton*, and proceeded towards *New York*. The country I have described before †. The fields were sown with wheat, rye, maize, oats, hemp, and flax. In several places, we saw very large pieces of ground with hemp.

WE saw abundance of chefnut-trees in the woods. They often stood in excessive poor ground, which was neither too dry nor too wet.

TULIP-TREES did not appear on the road; but the people said there were some in the woods.

THE *Beaver-tree* (*Magnolia glauca*) grows in the swamps. It was now in flower, and the fragrancy of its blossoms had so perfumed the air, that one could enjoy it before one approached the swamps; and this fine smell likewise shewed that a beaver-tree was near us, though we often happened not to see it.

THE

*See Vol. I. p. 220. † Ibid, p. 224—237.

THE *Phlox Glaberrima* grows abundantly in the woods, and cuts a fine figure with its red flowers. It grows in such soil here as in *Europe* is occupied by the *Lychnis viscaria* and *Lychnis dioica*, or red Catchfly and Campion. The *Phlox maculata* grows abundantly in wet ground, and has fine red and odoriferous flowers. It grows on low meadows, where in *Europe* the Meadow-pinks, or *Lychnis flos cuculi*, would be met with. By adding to these flowers the *Bartisia coccinea*, the *Lobelia cardinalis*, and the *Monarda didyma*, which grow wild in this country, they are undoubtedly altogether adorned with the finest red imaginable.

THE *Sassafras-tree* was abundant in the woods, and near the inclosures.

THE houses which we passed by were most of them wooden. In one place, I saw the people building a house with walls of mere clay, which is likewise employed in making ovens for baking.

BUCKWHEAT was already coming up in several places. We saw single plants of it all day in the woods, and in the fields, but always by the side of the road; from whence it may be concluded, that they spring up from lost and scattered seeds.

Late

LATE this evening we arrived at *New Brunswick* *.

June the 3d. At noon we went on board a yacht bound for *New York*, and sailed down the river, which had at first pretty high and steep banks, of red sandstone, on each side, which I have mentioned before. Now and then, there was a farm-house on the high shore. As we came lower down, we saw on both sides great fields and meadows, close up to the water. We could not sail at random with the yacht; for the river was often shallow in some places, and sometimes in the very middle. For that purpose, the course which we were to take was marked out by branches with leaves on them. At last we got into the sea, which bounded our prospect on the south; but on the other side, we were continually in sight of land at some distance. On coming to the mouth of the river, we had a choice of two roads to *New York*; viz. either within the *Staten Island*, or without it. The inhabitants are determined in their choice by the weather; for when it is stormy and cloudy, or dark, they do not venture to sail without, where the sea itself communicates. We took that course now,

* See an account of that place in Vol. I. p. 228.

† See Vol. I. p. 230.

Late

now, it being very pleasant weather ; and though we struck on the sands once or twice, yet we got loose again, and arrived at *New York* about nine o'clock. Of this town I have given an account in the preceding volume *.

June the 4th. I FOUND vines in several gardens, got from the old countries. They bear annually a quantity of excellent grapes. When the winters are very severe, they are killed by the frost, and die quite to the ground ; but the next spring new shoots spring up from the root.

STRAWBERRIES were now sold in abundance about the town every day. An *Englishman* from *Jamaica* asserted, that in that island there were no strawberries. The snakes are very fond of strawberries. Those which they had here were not so good as the *Swedish* and *Finland* ones.

RED CLOVER was sown in several places on the hills without the town. The country people were now employed in mowing the meadows. Some were already mown ; and the dry clover was put under cover, in order to be carried away the first opportunity.

CHERRY-TREES were planted in great quantities before the farm-houses, and along the

* See Vol. I. p. 247, &c.

the high-roads, from *Philadelphia* to *New Brunswick* ; but behind that place they became more scarce. On coming to *Staten Island*, in the province of *New York*, I found them very common again, near the gardens. Here are not so many varieties of cherries as there are in *Pensylvania*. I seldom saw any of the black sweet cherries * at *New York* ; but commonly the four red ones. All travellers are allowed to pluck ripe fruit in any garden which they pass by ; and not even the most covetous farmer can hinder them from so doing. Between *New Brunswick* and *Staten Island*, are a few cherry-gardens ; but proportionably more orchards, with apple-trees.

June the 6th. SEVERAL gentlemen and merchants, between fifty and sixty years of age, asserted, that during their life they had plainly found several kinds of fish decrease in number every year ; and that they could not get near so many fish now as they could formerly.

RUM, a brandy prepared from the sugar-canes, and in great use with all the *English North American* colonies, is reckoned much wholesomer than brandy, made from wine or corn †. In confirmation of this opinion,

* Commonly called *Black-heart Cherries*.

† That rum is among the spirituous liquors less noxious than any one of the rest, is chiefly owing to the balsamic quality

opinion, they say, that if you put a piece of fresh meat into rum, and another into brandy, and leave them there for some months; that in the rum will keep as it was, but that in the brandy will be quite eaten, and full of holes. But this experiment does not seem a very accurate one to me. Major *Roderfort* told me, that being upon the *Canada* expedition, he had observed, that such of his men as drank brandy for some time died of it; but those who drank rum were not hurt, though they got drunk with it every day, and oftener than the others.

LONG-ISLAND is the name of an island opposite the town of *New York*, in the sea. The northern part of the island is much more fertile than the southern. Formerly there lived a number of *Indians* on this island; and there are yet some, which however decrease in number every year, because they leave the island. The soil of the southern part of the island is very poor; but

quality it gets from the sugar, which corrects the styptic quality all kinds of brandy and spirituous liquors have. The older the rum is, and the longer it has been kept in a great cask, the more is its stypticity corrected. All which has been lately proved by the clearest experiments, explained and deducted from the most indisputable principles of chymistry, in a pamphlet written by that able chymist *Mr. Dossie*. F.

but this deficiency is made up by a vast quantity of oysters, lobsters, crabs, several kinds of fish, and numbers of water fowl, all which are there far more abundant than on the northern shores of the Island. Therefore the *Indians* formerly chose the southern part to live in, because they subsisted on oysters, and other productions of the sea. When the tide is out, it is very easy to fill a whole cart with oysters, which have been driven on shore by one flood. The Island is strewed with oyster-shells and other shells, which the *Indians* left there; these shells serve now for good manure for the fields. The southern part of the Island is turned into meadows, and the northern part into fields. The winter is more constant on the northern part, and the snow in spring lies longer there than on the southern part. The people are very fertile here, and commonly tall and strong.

June the 10th. At noon we left *New York*, and sailed up the river *Hudson*, in a yacht bound for *Albany*. All this afternoon we saw a whole fleet of little boats returning from *New York*, whither they had brought provisions and other goods for sale, which on account of the extensive commerce of this town, and the great number of its inhabitants, go off very well. The

river *Hudson* runs from North to South here, except some high pieces of land which sometimes project far into it, and alter its direction ; its breadth at the mouth is reckoned about a mile and a quarter. Some porpoisses played and tumbled in the river. The eastern shore, or the *New York* side, was at first very steep and high ; but the western was very sloping and covered with woods. There appeared farm-houses on both sides, surrounded with corn-fields. The ground of which the steep shores consisted was of a pale brick colour, and some little rocks of a grey sand-stone were seen here and there. About ten or twelve miles from *New York*, the western shore appears quite different from what it was before ; it consists of steep mountains with perpendicular sides towards the river, and they are exactly like the steep sides of the mountains of *Hall* and *Hunneburg* in *West Gothland*. Sometimes a rock projects like the salient angle of a bastion : the tops of these mountains are covered with oaks, and other wood ; a number of stones of all sizes lay along the shore, having rolled down from the mountains.

THESE high and steep mountains continue for some *English* miles on the western shore ; but on the eastern side the land is high,

high, and sometimes diversified with hills and valleys, which are commonly covered with deciduous trees, amongst which there appears a farm now and then in a glade. The hills are covered with stones in some places. About twelve miles from *New York* we saw *Sturgeons** (*Acipenser sturio*), leaping up out of the water, and on the whole passage we met with porpoises in the river. As we proceeded we found the eastern banks of the river very much cultivated; and a number of pretty farms surrounded with orchards and fine corn-fields, presented themselves to our view. About twenty-two miles from *New York*, the high mountains which I have before mentioned left us, and made as it were a high ridge here from east to west quite across the country. This altered the face of the country on the western shore of the river: from mountainous, it became interspersed with little vallies and round hillocks, which were scarce inhabited at all; but the eastern shore continued to afford us a delightful prospect. After sailing a little while in the night, we cast our anchor and lay here

P 3

till

* The *New-York Sturgeons* which I saw this year brought over, had short blunt noses, in which particular they are different from the *English* ones, which have long noses. F.

till the morning, especially as the tide was ebbing with great force.

June the 11th. This morning we continued our voyage up the river, with the tide and a faint breeze. We now passed the *Highland* mountains, which were to the East of us ; they consist of a grey sandstone, are very high and pretty steep, and covered with deciduous trees, and likewise with firs and red cedars. The western shore was full of rocks, which however did not come up to the height of the mountains on the opposite shore ; the tops of these eastern mountains were cut off from our sight by a thick fog which surrounded them. The country was unfit for cultivation, being so full of rocks, and accordingly we saw no farms. The distance from these mountains to *New York* is computed at thirty-six *English* miles.

A thick fog now rose up from the high mountains. For the space of some *English* miles, we had hills and rocks on the western banks of the river ; and a change of lesser and greater mountains and vallies covered with young firs, red cedars, and oaks, on the eastern side. The hills close to the river side are commonly low, but their height increases as they are further from the river. Afterwards we saw, for some miles together,

together, nothing but high round mountains and valleys, both covered with woods; the valleys are in reality nothing but low rocks, and stand perpendicular towards the river in many places. The breadth of the river is sometimes two or three musket shot, but commonly not above one; every now and then we saw several kinds of fish leaping out of the water. The wind vanished away about ten o'clock in the morning, and forced us to get forwards with our oars, the tide being almost spent. In one place on the western shore we saw a wooden house painted red, and we were told, that there was a saw-mill further up; but besides this we did not perceive one farm or any cultivated grounds all this forenoon.

THE water in the river has here no more a brackish taste; yet I was told that the tide, especially when the wind is South, sometimes carries the salt water up higher with it. The colour of the water was likewise altered, for it appeared darker here than before. To account for the first origin of rivers is very difficult, if not wholly impossible; some rivers may have come from a great reservoir of water, which being considerably encreased by heavy falls of rain or other circumstances, passed its old bounds and flowed to the lower coun-

tries, through the places where it met with the least opposition. This is perhaps the reason why some rivers run in so many bendings equally through fields of soft earth, as likewise there, where mountains, rocks, and stones, divert their passage. However it seems that some rivers derive their first origin from the creation itself, and that Providence then pointed out their course; for their existence can, in all probability, not be owing to the accidental eruption of water alone. Among these rivers we may rank the river *Hudson*: I was surprised on seeing its course, and the variety of its shores. It takes its rise a good way above *Albany*, and descends to *New York*, in a direct line from North to South, which is a distance of about a hundred and sixty *English* miles, and perhaps more; for the little bendings which it makes are of no signification. In many places between *New York* and *Albany*, are ridges of high mountains running West and East. But it is remarkable that they go on undisturbed till they come to the river *Hudson*, which cuts directly across them, and frequently their sides stand perpendicular towards the river. There is an opening left in the chain of mountains, as broad as the river commonly is, for it to pass through, and the mountains go on as before,

before, on the other side, in the same direction. It is likewise remarkable, that the river in such places where it passes through the mountains is as deep, and often deeper than in the other places. The perpendicular rocks on the sides of the river are surprising, and it appears that if no passages had been opened by Providence, for the river to pass through, the mountains in the upper part of the country would have been inundated, since these mountains, like so many dykes, would have hindered the water from going on. *Quere*, Why does this river go on in a direct line for so considerable a distance? Why do the many passages, through which the river flows across the mountains, ly under the same meridian? Why are waterfalls near some of these passages, or at least shallow water with a rocky ground?

WE now perceived excessive high and steep mountains on both sides of the river, which echoed back each sound we uttered. Yet notwithstanding they were so high and steep, they were covered with small trees.

THE *Blue Mountains*, which reared their towering tops above all the other mountains, were now seen before us, towards *North*, but at a great distance.

THE country began here to look more cultivated, and less mountainous.

THE

THE last of the high western mountains is called *Butterbill*, after which the country between the mountains grows more spacious. The farms became very numerous, and we had a prospect of many corn-fields, between the hills: before we passed these hills we had the wind in our face, and we could only get forward by tacking, which went very slow, as the river was hardly a musket-shot in breadth. Afterwards we cast anchor, because we had both wind and tide against us.

WHILST we waited for the return of tide and the change of wind, we went on shore.

THE *Sassafras-tree* (*Laurus Sassafras*) and the chefnut-tree grows here in great abundance. I found the tulip-tree (*Liriodendron tulipifera*) in some parts of the wood, as likewise the *Kalmia latifolia*, which was now in full blossom; though the flowers were already withering.

SOME time after noon the wind arose from South-west, which being a fair wind, we weighed anchor, and continued our voyage. The place where we lay at anchor, was just the end of those steep and amazing high mountains: their height is very amazing; they consist of grey rock stone, and close to them, on the shore, lay a vast

number of little stones. As soon as we had passed these mountains, the country became clearer of mountains, and higher. The river likewise encreased in breadth, so as to be near an *English* mile broad. After sailing for some time, we found no more mountains along the river; but on the eastern side goes a high chain of mountains to the north-east, whose sides are covered with woods, up to one half of their height. The summits however are quite barren; for I suppose that nothing would grow there, on account of the great degree of heat*, dryness, and the violence of the wind, to which that part is exposed. The eastern side of the river is much more cultivated than the western, where we seldom saw a house, the land being covered with woods, though it is in general very level. About fifty-six *English* miles from *New York* the country is not very high; yet it is every where covered with woods, except some new farms which were scattered here and there. The high mountains

* Mr. *Kalm* was certainly mistaken, by thinking the summits of these mountains without wood, on account of the great degree of heat: for it is a general notion, founded on experience, that the sun operates not so much on the tops of mountains, as in plains or vallies, and the cold often hinders the increase of wood on the summits of high mountains. F.

tains which we left in the afternoon, now appeared above the woods and the country. These mountains, which were called the *Higblands*, did not project more North than the other, in the place where we anchored. Their sides (not those towards the river) were seldom perpendicular, but sloping, so that one could climb up to the top, though not without difficulty.

ON several high grounds near the river, the people burnt lime. The master of the yacht told me, that they break a fine blueish grey limestone in the high grounds, along both sides of the river, for the space of some *Englisch* miles, and burn lime of it. But at some miles distance there is no more limestone, and they find also none on the banks till they come to *Albany*.

WE passed by a little neck of land, which projected on the western side in the river, and was called *Dance*. The name of this place is said to derive its origin from a festival which the *Dutch* celebrated here in former times, and at which they danced and diverted themselves; but once there came a number of *Indians*, who killed them all.

WE cast anchor late at night, because the wind ceased and the tide was ebbing. The depth of the river is twelve fathoms here,

THE

THE fire-flies passed the river in numbers, at night, and sometimes settled upon the rigging.

June the 12th. THIS morning we proceeded with the tide, but against the wind. The river was here a musket-shot broad. The country in general is low on both sides, consisting of low rocks, and stony fields, which are however covered with woods. It is so rocky, stony, and poor, that nobody can settle in it, or inhabit it, there being no spot of ground fit for a corn-field. The country continued to have the same appearance for the space of some miles, and we never perceived one settlement. At eleven o'clock this morning we came to a little island, which lies in the middle of the river, and is said to be half-way between *New York* and *Albany*. The shores are still low, stony, and rocky, as before. But at a greater distance we saw high mountains, covered with woods, chiefly on the western shore, raising their tops above the rest of the country: and still further off, the *Blue Mountains* rose up above them. Towards noon it was quite calm, and we went on very slow. Here, the land is well cultivated, especially on the eastern shore, and full of great corn-fields; yet the soil seemed sandy. Several

Several villages lay on the eastern side, and one of them, called *Straßburg*, was inhabited by a number of *Germans*. To the West we saw several cultivated places. The *Blue Mountains* are very plainly to be seen here. They appear through the clouds, and tower above all other mountains. The river is full an *English* mile broad opposite *Straßburg*.

THEY make use of a yellow *Agaricus*, or mushroom, which grows on maple-trees, for tinder; that which is found on the red-flowering maple (*Acer rubrum*) is reckoned the best, and next in goodness is that of the *Sugar-maple* (*Acer saccharinum*), which is sometimes reckoned as good as the former.

RHINBECK is a place at some distance from *Straßburg*, further off from the river. It is inhabited by many *Germans*, who have a church there. Their clergyman at present was the Rev. Mr. *Hartwig*, who knew some *Swedish*, having been at *Gottenburg* for some time. This little town is not visible from the river-side.

AT two in the afternoon it began again to blow from the south, which enabled us to proceed. The country on the eastern side is high, and consists of a well cultivated soil. We had fine corn-fields, pretty

ty farms, and good orchards, in view. The western shore is likewise somewhat high, but still covered with woods, and we now and then, though seldom, saw one or two little settlements. The river is above an *English* mile broad in most places, and comes in a strait line from the North, so that we could not sometimes follow it with our eye.

June the 13th. THE wind favoured our voyage during the whole night, so that I had no opportunity of observing the nature of the country. This morning at five o'clock we were but nine *English* miles from *Albany*. The country on both sides the river is low, and covered with woods, excepting a few little scattered settlements. Under the higher shores of the river are wet meadows, covered with sword-grass (*Carex*), and they formed several little islands. We saw no mountains; and hastened towards *Albany*. The land on both sides of the river is chiefly low, and more carefully cultivated as we came nearer to *Albany*.

As to the houses, which we saw, some were of wood, others of stone. The river is seldom above a musket-shot broad, and in several parts of it are sands, which require great experience for governing the yachts.

yachts. At eight o'clock in the morning we arrived at *Albany*.

ALL the yachts which ply between *Albany* and *New York*, belong to *Albany*. They go up and down the river *Hudson*, as long as it is open and free from ice. They bring from *Albany* boards or planks, and all sorts of timber, flour, pease, and furs, which they get from the *Indians*, or which are smuggled from the *French*. They come home almost empty, and only bring a few merchandizes with them, among which rum is the chief. This last is absolutely necessary to the inhabitants of *Albany*; they cheat the *Indians* in the fur trade with it; for when the *Indians* are drunk, they will leave it to the *Albanians* to fix the price of the furs. The yachts are pretty large, and have a good cabin, in which the passengers can be very commodiously lodged. They are commonly built of *red Cedar*, or of *white Oak*. Frequently, the bottom consists of white oak, and the sides of red cedar, because the latter withstands putrefaction much longer than the former. The red cedar is likewise apt to split, when it hits against any thing, and the river *Hudson* is in many parts full of sands and rocks, against which the keel of the yacht sometimes hits; therefore they

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they choose white oak for the bottom, as being the softer wood, and not splitting so easily : and the bottom being continually under water, is not so much exposed to putrefaction, and holds out longer.

THE *Canoes* which the yachts have along with them, are made of a single piece of wood, hollowed out ; they are sharp on both ends, frequently three or four fathoms long, and as broad as the thickness of the wood will allow. The people in it do not row sitting, but commonly a fellow stands at each end, with a short oar in his hand, with which he governs and brings the canoe forwards. Those which are made here at *Albany*, are commonly of the *white Pine* ; they can do service for eight or twelve years, especially if they be tarred and painted. At *Albany* they make them of the white pine, since there is no other wood fit for them ; at *New York* they are made of the tulip-tree, and in other parts they are made of red or white cedars : but both these trees are so small, in the neighbourhood of *Albany*, that they are unfit for canoes ; there are no seats in the canoes, for if they had any, they would be more liable to be overfet, as one could not keep the equilibrium so well.

VOL. II.

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BATTOES

BATTOES * are another kind of boats, which are much in use in *Albany*: they are made of boards of white pine; the bottom is flat, that they may row the better in shallow water; they are sharp at both ends, and somewhat higher towards the end than in the middle. They have seats in them, and are rowed as common boats. They are long, yet not all alike, commonly three, and sometimes four fathoms long. The height from the bottom to the top of the board (for the sides stand almost perpendicular) is from twenty inches to two feet, and the breadth in the middle about a yard and six inches. They are chiefly made use of for carrying goods, by means of the rivers, to the *Indians*; that is, when those rivers are open enough for the battoes to pass through, and when they need not be carried by land a great way. The boats made of the bark of trees, break easily by knocking against a stone, and the canoes cannot carry a great cargo, and are easily overset; the battoes are therefore preferable to them both. I saw no boats here like those in *Sweden*, and other parts of *Europe*.

THE frost does frequently a great deal of damage

* From the French *Bateaux* (*Boats*).

damage at *Albany*. There is hardly a month in summer during which a frost does not happen. The spring comes very late, and in *April* and *May* are numerous cold nights, which frequently kill the flowers of trees and kitchen-herbs. It was feared that the blossoms of the apple-trees had been so severely damaged by the frost, last *May*, that next autumn there would be but very few apples. The oak-blossoms are very often killed by the frost in the woods. The autumn here is of long continuance, with warm days and nights. However, the cold nights commonly commence towards the end of *September*, and are frequent in *October*. The people are forced to keep their cattle in stables, from the middle of *November*, till *March* or *April*, and must find them hay during that time*.

DURING summer, the wind blows commonly from the South, and brings a great drought along with it. Sometimes it rains a little, and as soon as it has rained the wind veers to North West, blowing for several days from that point, and then returning to the South. I have had fre-

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* The reader must reckon all this according to the old stile.

quent opportunities of seeing this change of wind happen very exactly, both this year and the following.

June the 15th. The enclosures were made of boards of fir-wood, of which there is abundance in the extensive woods, and many saw-mills to cut it into boards.

THE several sorts of apple-trees grow very well here, and bear as fine fruit as in any other part of *North America*. Each farm has a large orchard. They have some apples here, which are very large, and very palatable; they are sent to *New York*, and other places as a rarity. They make excellent cyder, in autumn, in the country round *Albany*.

ALL the kinds of cherry-trees, which have been planted here, succeed very well.

PEAR-TREES do not succeed here. This was complained of in many other parts of *North America*. But I fear that they do not take sufficient care in the management and planting of them; for I have seen fine pears in several parts of *North America*.

PEACH-TREES have often been planted here, and never would succeed well. This was attributed to a worm which lives in the ground, and eats through the root, so that

that the tree dies. Perhaps the severity of the winter contributes much to it.

THEY plant no other fruit-trees at *Albany* besides these I have mentioned.

THEY sow as much hemp and flax here, as they want for home consumption.

THEY sow maize in great abundance: A loose soil is reckoned the best for this purpose; for it will not grow in clay. From half a bushel they reap a hundred bushels. They reckon maize a very good kind of corn, because the shoot recovers after being hurt by the frost. They have had examples here of the shoots dying twice in spring, to the very ground, and yet they shot up again afterwards, and afforded an excellent crop. Maize has likewise the advantage of standing much longer against a drought, than wheat. The larger sort of maize which is commonly sown here, ripens in *September*.

THEY sow wheat in the neighbourhood of *Albany*, with great advantage. From one bushel they get twelve sometimes; if the soil be good, they get twenty bushels. If their crop amounts only to ten bushels from one, they think it very trifling. The inhabitants of the country round *Albany*, are *Dutch* and *Germans*. The *Germans* live in several great villages, and sow great quantities

quantities of wheat, which is brought to *Albany*; and from thence they send many yachts laden with flour to *New York*. The wheat-flour from *Albany* is reckoned the best in all *North America*, except that from *Sopus* or *King's Town*, a place between *Albany* and *New York*. All the bread in *Albany* is made of wheat. At *New York* they pay the *Albany* flour with several shillings more *per* hundred weight, than that from other places.

RYE is likewise sown here, but not so generally as wheat.

THEY do not sow much barley here, because they do not reckon the profits very great. Wheat is so plentiful that they make malt of it. In the neighbourhood of *New York*, I saw great fields sown with barley.

* THEY do not sow more oats than are necessary for their horses.

THE *Dutch* and *Germans* who live hereabouts, sow pease in great abundance; they succeed very well, and are annually carried to *New York*, in great quantities. They have been free from insects for a considerable time. But of late years the same beetles which destroy the pease in *Pensylvania*, *New Jersey*, and the lower parts of the province of *New York* *, have likewise appeared

* I have mentioned them before. See vol. i. p. 176, 177.

appeared abundant among the pease here. It is a real loss to this town, and to the other parts of *North America*, which used to get pease from hence for their own consumption, and that of their sailors. It had been found that if they procured good pease from *Albany*, and sowed them near *King's Town*, or the lower part of the province of *New York*, they succeeded very well the first year, but were so full of worms the second, and following years, that nobody could or would eat them. Some people put ashes into the pot, among the pease, when they will not boil, or soften well; but whether this is wholesome and agreeable to the palate, I do not know.

POTATOES are generally planted. Some people preferred ashes to sand for keeping them in during winter.

THE *Bermuda Potatoes* (*Convolvulus Batatas*) have likewise been planted here, and succeed pretty well. The greatest difficulty is to keep them during winter; for they generally rot in that season.

THE *Humming-bird* (*Trochilus Colubris*) comes to this place sometimes; but is rather a scarce bird.

THE shingles with which the houses are covered are made of the White Pine, which

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is reckoned as good and as durable, and sometimes better, than the White Cedar (*Cupressus thyoides*). The White Pine is found abundant here, in such places where common pines grow in *Europe*. I have never seen them in the lower parts of the province of *New York*, nor in *New Jersey* and *Pennsylvania*. They saw a vast quantity of deal from the White Pine on this side of *Albany*, which are brought down to *New York*, and from thence exported.

THE woods abound with vines, which likewise grow on the steep banks of the river in surprising quantities. They climbed to the tops of trees on the bank, and bent them by their weight. But where they found no trees, they hung down along the steep shores, and covered them entirely. The grapes are eaten after the frost has attacked them; for they are too sour before. They are not much used any other way.

THE vast woods and uninhabited grounds, between *Albany* and *Canada*, contain immense swarms of gnats, which annoy the travellers. To be in some measure secured against these insects, some besmear their face with butter or grease; for the gnats do not like to settle on greasy places. The great heat makes boots very uneasy; but to prevent the gnats from stinging the legs, they wrap some paper round them, under the stockings.

stockings. Some travellers wear caps which cover the whole face, and have some gauze before the eyes. At night they lie in tents, if they can carry any with them; and make a great fire at the entrance, by the smoke of which the gnats are driven away.

THE porpoisses seldom go higher up the river *Hudson* than the salt water goes; after that, the sturgeons fill their place. It has however sometimes happened, that porpoisses have gone quite up to *Albany*.

THERE is a report, that a whale once came up the river quite to this town.

THE Fireflies (*Lampyrus*) which are the same that are so common in *Pennsylvania* during summer, are seen here in abundance every night. They fly up and down in the streets of this town. They come into the houses, if the doors and windows are open.

SEVERAL of the *Pennsylvanian* trees are not to be met with in these woods; viz.

Magnolia glauca, the *Beaver-tree*.

Nyssa aquatica, the *Tupelo-tree*.

Liquidambar styraciflua, the *Sweet-gum tree*.

Diospyros Virginiana, the *Perfimon*.

Liriodendron tulipifera, the *Tulip-tree*.

Juglans nigra, the *black Walnut-tree*.

Quercus —, the *Swamp Oak*.

Cercis Canadensis, the *Sallad-tree*.

Robinia pseudacacia, the *Locust-tree*.

Gleditsia

Gleditsia triacanthos, the Honey-locust tree.

Annona muricata, the Papaw-tree.

Celtis occidentalis, the Nettle-tree. And a number of shrubs, which are never found here.

THE more northerly situation of the place, the height of the *Blue Mountains*, and the course of the rivers, which flow here southward into the sea, and accordingly carry the seeds of plants from north to south, and not the contrary way, are chiefly the causes that several plants which grow in *Pensylvania* cannot be found here.

THIS afternoon I went to see an island which lies in the middle of the river, about a mile below the town. This island is an *English* mile long, and not above a quarter of a mile broad. It is almost entirely turned into corn-fields; and is inhabited by a single planter, who, besides possessing this island, is the owner of two more. Here we saw no woods, except a few trees which were left round the island on the shore, and formed as it were a tall and great hedge. The Red Maple (*Acer rubrum*) grows in abundance in several places. Its leaves are white or silvery on the under sides, and, when agitated by the wind, they make the tree appear as if it was full of white flowers. The Water-beech (*Platanus occidentalis*) grows to a great height, and is
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one of the most shady trees here. The *Water-poplar** is the most common tree hereabouts, grows exceedingly well on the shores of the river, and is as tall as the tallest of our aspens. In summer it affords the best shade for men and cattle against the scorching heat. On the banks of rivers and lakes it is one of the most useful trees, because it holds the soil by its extensive branched roots, and prevents the water from washing it away. The Water-beech and the Elm-tree (*Ulmus*) serve the same purpose. The wild Prune-trees were plentiful here, and were full of unripe fruit. Its wood is not made use of; but its fruit is eaten. Sumach (*Rhus glabra*) is plentiful here; as also the wild vines, which climb up the trees, and creep along the high shores of the river. I was told, that the grapes ripen very late, though they were already pretty large.

THE *American Elm-tree* (*Ulmus Americana*) formed several high hedges. The soil of this island is a rich mould, mixed with sand, which is chiefly employed in maize plantations. There were likewise large fields of potatoes. The whole island was

* *Populus glandulis variis basi foliorum adnexus, foliis cordato-deltoidibus, acuminatis, serrato-angulosis, utrinque glabris, —An Populus heterophylla Linnæi?*

was leased for one hundred pounds of *New York* currency. The person who had taken the lease, again let some greater and some smaller lots of ground, to the inhabitants of *Albany*, for making kitchen-gardens of; and by that means reimbursed himself. Portulack (*Portulaca oleracea*) grows spontaneously here in great abundance, and looks very well.

June the 20th. The tide in the river *Hudson* goes about eight or ten *English* miles above *Albany*, and consequently runs one hundred and fifty-six *English* miles from the sea. In spring, when the snow melts, there is hardly any flowing near this town; for the great quantity of water which comes from the mountains during that season, occasions a continual ebbing. This likewise happens after heavy rains.

THE cold is generally reckoned very severe here. The ice in the river *Hudson* is commonly three or four feet thick. On the 3d of *April* some of the inhabitants crossed the river with six pair of horses. The ice commonly dissolves about the end of *March*, or beginning of *April*. Great pieces of ice come down about that time, which sometimes carry with them the houses that stand close to the shore. The water is very high at that time in the river,

river, because the ice stops sometimes, and sticks in places where the river is narrow. The water has been often observed to rise three fathom higher than it commonly is in summer. The ground is frozen here in winter to the depth of three, four, or five feet. On the 16th of *November* the yachts are put up, and about the beginning or middle of *April* they are in motion again. They are unacquainted with stoves; and their chimnies are so wide that one could drive through them with a cart and horses.

THE water of several wells in this town was very cool about this time; but had a kind of acid taste, which was not very agreeable. On a nearer examination, I found an abundance of little insects in it, which were probably *Monoculi*. Their length was different; some were a geometrical line and an half, others two, and others four lines long. They were very narrow, and of a pale colour. The head was blacker and thicker than the other parts of the body, and about the size of a pin's head. The tail was divided into two branches, and each branch terminated in a little black globule. When these insects swim, they proceed in crooked or undulated lines, almost like *Tadpoles*. I poured some of this water into a bowl, and put near a fourth part of rum to it.

it. The *Monoculi*, instead of being affected with it, swam about as briskly as they had done in the water. This shews, that if one makes punch with this water, it must be very strong to kill the *Monoculi*. I think this water is not very wholesome for people who are not used to it, though the inhabitants of *Albany*, who drink it every day, say, they do not feel the least inconvenience from it. I have been several times obliged to drink water here, in which I have plainly seen *Monoculi* swimming; but I generally felt the next day somewhat like a pea in my throat, or as if I had a swelling there; and this continued for above a week. I felt such swellings this year, both at *Albany* and in other parts. My servant, *Yungstroem*, likewise got a great pain in his breast, and a sensation as from a swelling, after drinking water with *Monoculi* in it: but whether these insects occasioned it, or whether it came from some other cause, I cannot ascertain. However, I have always endeavoured, as much as possible, to do without such water as had *Monoculi* in it. I have found *Monoculi* in very cold water, taken from the deepest wells, in different parts of this country. Perhaps many of our diseases arise from waters of this kind, which we do not sufficiently examine. I have frequently

frequently observed abundance of minute insects in water, which has been remarkable for its clearness. Almost each house in *Albany* has its well, the water of which is applied to common use ; but for tea, brewing, and washing, they commonly take the water of the river *Hudson*, which flows close by the town. This water is generally quite muddy, and very warm in summer ; and, on that account, it is kept in cellars, in order that the slime may subside, and that the water may cool a little.

WE lodged with a gunsmith, who told us, that the best charcoals for the forge were made of the *Black Pine*. The next in goodness, in his opinion, were charcoals, made of the *Beech-tree*.

THE best and dearest stocks for his muskets were made of the wood of the wild Cherry-tree ; and next to these he valued those of the Red Maple most. They scarce make use of any other wood for this purpose. The black Walnut-tree affords excellent wood for stocks ; but it does not grow in the neighbourhood of *Albany*.

June the 21st. NEXT to the town of *New York*, *Albany* is the principal town, or at least the most wealthy, in the province of *New York*. It is situated on the declivity of a hill, close to the western shore of the river

river *Hudson*, about one hundred and forty-six *English* miles from *New York*. The town extends along the river, which flows here from N. N. E. to S. S. W. The high mountains in the west, above the town, bound the prospect on that side. There are two churches in *Albany*, an *English* one and a *Dutch* one. The *Dutch* church stands at some distance from the river, on the east side of the market. It is built of stone; and in the middle it has a small steeple, with a bell. It has but one minister, who preaches twice every *Sunday*. The *English* church is situated on the hill, at the west end of the market, directly under the fort. It is likewise built of stone, but has no steeple. There was no service at this church at this time, because they had no minister; and all the people understood *Dutch*, the garrison excepted. The minister of this church has a settled income of one hundred pounds sterling, which he gets from *England*. The town-hall lies to the southward of the *Dutch* church, close by the river side. It is a fine building of stone, three stories high. It has a small tower or steeple, with a bell, and a gilt ball and vane at the top of it.

THE houses in this town are very neat, and partly built with stones covered with shingles

gles of the *White Pine*. Some are slated with tiles from *Holland*, because the clay of this neighbourhood is not reckoned fit for tiles. Most of the houses are built in the old way, with the gable-end towards the street; a few excepted, which were lately built in the manner now used. A great number of houses were built like those of *New Brunswick*, which I have described*; the gable-end being built, towards the street, of bricks, and all the other walls of planks. The outside of the houses is never covered with lime or mortar, nor have I seen it practised in any *North-American* towns which I have visited; and the walls do not seem to be damaged by the air. The gutters on the roofs reach almost to the middle of the street. This preserves the walls from being damaged by the rain; but is extremely disagreeable in rainy weather for the people in the streets, there being hardly any means of avoiding the water from the gutters. The street-doors are generally in the middle of the houses; and on both sides are seats, on which, during fair weather, the people spend almost the whole day, especially on those which are in the shadow of the houses. In the evening these seats are covered with people of both sexes; but this

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* See Vol. I. p. 228, &c.

is rather troublesome, as those who pass by are obliged to greet every body, unless they will shock the politeness of the inhabitants of this town. The streets are broad, and some of them are paved; in some parts they are lined with trees; the long streets are almost parallel to the river, and the others intersect them at right angles. The street which goes between the two churches, is five times broader than the others, and serves as a market-place. The streets upon the whole are very dirty, because the people leave their cattle in them, during the summer nights. There are two market-places in the town, to which the country people resort twice a week.

THE fort lies higher than any other building, on a high steep hill on the west side of the town. It is a great building of stone, surrounded with high and thick walls; its situation is very bad, as it can only serve to keep off plundering parties, without being able to sustain a siege. There are numerous high hills to the west of the fort, which command it, and from whence one may see all that is done within it. There is commonly an officer and a number of soldiers quartered in it. They say the fort contains a spring of water.

THE situation of *Albany* is very advantageous

tageous in regard to trade. The river *Hudson*, which flows close by it, is from twelve to twenty feet deep. There is not yet any quay made for the better lading of the yachts, because the people feared it would suffer greatly, or be entirely carried away in spring by the ice, which then comes down the river; the vessels which are in use here, may come pretty near the shore in order to be laden, and heavy goods are brought to them upon canoes tied together. *Albany* carries on a considerable commerce with *New York*, chiefly in furs, boards, wheat, flour, pease, several kinds of timber, &c. There is not a place in all the *British* colonies, the *Hudson's Bay* settlements excepted, where such quantities of furs and skins are bought of the *Indians*, as at *Albany*. Most of the merchants in this town send a clerk or agent to *Oswego*, an *English* trading town upon the lake *Ontario*, to which the *Indians* resort with their furs. I intend to give a more minute account of this place in my *Journal* for the year 1750. The merchants from *Albany* spend the whole summer at *Oswego*, and trade with many tribes of *Indians* who come to them with their goods. Many people have assured me, that the *Indians* are frequently cheated in disposing of their goods, especially when they are in

liquor, and that sometimes they do not get one half or even one tenth of the value of their goods. I have been a witness to several transactions of this kind. The merchants of *Albany* glory in these tricks, and are highly pleased when they have given a poor *Indian* a greater portion of brandy than he can bear, and when they can after that get all his goods for mere trifles. The *Indians* often find when they are sober again, that they have been cheated, they grumble somewhat, but are soon satisfied when they reflect that they have for once drank as much as they are able, of a liquor which they value beyond any thing else in the whole world, and they are quite insensible to their loss, if they again get a draught of this nectar. Besides this trade at *Oswego*, a number of *Indians* come to *Albany* from several parts, especially from *Canada*; but from this latter place, they hardly bring any thing but beaver-skins. There is a great penalty in *Canada* for carrying furs to the *English*, that trade belonging to the *French West India Company*; notwithstanding which the *French* merchants in *Canada* carry on a considerable smuggling trade. They send their furs, by means of the *Indians*, to their correspondents at *Albany*, who purchase it at the price which they have

have fixed upon with the *French* merchants. The *Indians* take in return several kinds of cloth, and other goods, which may be got here at a lower rate than those which are sent to *Canada* from *France*.

THE greater part of the merchants at *Albany* have extensive estates in the country, and a great deal of wood. If their estates have a little brook, they do not fail to erect a saw-mill upon it for sawing boards and planks, with which commodity many yachts go during the whole summer to *New York*, having scarce any other loading than boards.

Many people at *Albany* make the *wampum* of the *Indians*, which is their ornament and their money, by grinding some kinds of shells and muscles; this is a considerable profit to the inhabitants. I shall speak of this kind of money in the sequel. The extensive trade which the inhabitants of *Albany* carry on, and their sparing manner of life, in the *Dutch* way, contribute to the considerable wealth which many of them acquire.

THE inhabitants of *Albany* and its environs are almost all *Dutchmen*. They speak *Dutch*, have *Dutch* preachers, and divine service is performed in that language: their manners are likewise quite *Dutch*; their dress is however like that of the *English*. It is well known that the first

Europeans who settled in the province of *New York* were *Dutchmen*. During the time that they were the masters of this province, they possessed themselves of *New Sweden**, of which they were jealous. However the pleasure of possessing this conquered land and their own, was but of short duration ; for towards the end of 1664, Sir *Robert Carre*, by order of King *Charles* the second, went to *New York*, then *New Amsterdam*, and took it. Soon after Colonel *Nichols* went to *Albany*, which then bore the name of *Fort Orange*, and upon taking it, named it *Albany*, from the Duke of *York's* *Scotch* title. The *Dutch* inhabitants were allowed either to continue where they were, and, under the protection of the *English*, to enjoy all their former privileges, or to leave the country. The greater part of them chose to stay, and from them the *Dutchmen* are descended, who now live in the province of *New York*, and who possess the greatest and best estates in that province.

THE avarice and selfishness of the inhabitants of *Albany* are very well known throughout all *North America*, by the *English*, by the *French*, and even by the *Dutch*, in the lower part of *New York* province. If a Jew, who understands the art of getting forward

* *New Jersey* and part of *Pennsylvania* were formerly comprized under this name.

forward perfectly well, should settle amongst them, they would not fail to ruin him. For this reason nobody comes to this place without the most pressing necessity; and therefore I was asked in several places, what induced me to go to it, two years one after another. I likewise found that the judgment, which people formed of them, was not without foundation. For though they seldom see any strangers, (except those who go from the *British* colonies to *Canada* and back again) and one might therefore expect to find victuals and accommodation for travellers cheaper than in places, where travellers always resort to; yet I experienced the contrary. I was here obliged to pay for every thing twice, thrice, and four times as dear as in any part of *North America* which I have passed through. If I wanted their assistance, I was obliged to pay them very well for it, and when I wanted to purchase any thing, or to be helped in some case or other, I could presently see what kind of blood ran in their veins; for they either fixed exorbitant prices for their services, or were very backward to assist me. Such was this people in general. However, there were some amongst them who equalled any in *North America*, or any where else, in politeness, equity, goodness,

and readiness to serve and to oblige; but their number fell far short of that of the former. If I may be allowed to declare my conjectures, the origin of the inhabitants of *Albany* and its neighbourhood seems to me to be as follows. Whilst the *Dutch* possessed this country, and intended to people it, the government took up a pack of vagabonds, of which they intended to clear the country, and sent them along with a number of other settlers to this province. The vagabonds were sent far from the other colonists, upon the borders towards the *Indians* and other enemies, and a few honest families were persuaded to go with them, in order to keep them in bounds. I cannot any other way account for the difference between the inhabitants of *Albany*, and the other descendants of so respectable a nation as the *Dutch*, who are settled in the lower part of *New York* province. The latter are civil, obliging, just in the prices, and sincere; and though they are not ceremonious, yet they are well meaning and honest, and their promises are to be relied on.

THE behaviour of the inhabitants of *Albany*, during the war between *England* and *France*, which was ended with the peace of *Aix la Chapelle*, has, among several other causes, contributed to make them
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the object of hatred in all the *British* colonies, but more especially in *New England*. For at the beginning of that war, when the *Indians* of both parties had received orders to commence hostilities, the *French* engaged theirs to attack the inhabitants of *New England*; which they faithfully executed, killing every body they met with, and carrying off whatever they found. During this time the people of *Albany* remained neutral, and carried on a great trade with the very *Indians* who murdered the inhabitants of *New England*. The plate, such as silver spoons, bowls, cups, &c. of which the *Indians* robbed the houses in *New England*, was carried to *Albany*, for sale. The people of that town bought up these silver vessels, though the names of the owners were graven on many of them, and encouraged the *Indians* to get more of them, promising to pay them well, and whatever they would demand. This was afterwards interpreted by the inhabitants of *New England*, as if the *Albanians* encouraged the *Indians* to kill more of the people, who were in a manner their brothers, and who were subjects of the same crown. Upon the first news of this behaviour, which the *Indians* themselves spread

spread in *New England*, the inhabitants of the latter province were greatly incensed, and threatened, that the first step they would take in another war, would be to burn *Albany*, and the adjacent parts. In the present war it will sufficiently appear how backward the other *British* provinces in *America* are in assisting *Albany*, and the neighbouring places, in case of an attack from the *French* or *Indians* *. The hatred which the *English* bear against the people, at *Albany*, is very great, but that of the *Albanians* against the *English* is carried to a ten times higher degree. This hatred has subsisted ever since the time when the *English* conquered this country, and is not yet extinguished, though they could never have got such advantages under the *Dutch* government, as they have obtained under that of the *English*. For in a manner, their privileges are greater than those of *Englishmen*.

THE inhabitants of *Albany* are much more sparing than the *English*. The meat which is served up is often insufficient to satisfy the stomach, and the bowl does not
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* Mr. *Kalm* published his third volume just during the time of the last war. F.

circulate so freely as amongst the *English*. The women are perfectly well acquainted with œconomy; they rise early, go to sleep very late, and are almost over nice and cleanly, in regard to the floor, which is frequently scoured several times in the week. The servants in the town are chiefly negroes. Some of the inhabitants wear their own hair, but it is very short, without a bag or queue, which are looked upon as the characteristics of *Frenchmen*; and as I wore my hair in a bag the first day I came here from *Canada*, I was surrounded with children, who called me *Frenchman*, and some of the boldest offered to pull at my *French* dress.

THEIR meat, and manner of dressing it, is very different from that of the *English*. Their breakfast is tea, commonly without milk. About thirty or forty years ago, tea was unknown to them, and they breakfasted either upon bread and butter, or bread and milk. They never put sugar into the cup, but take a small bit of it into their mouths whilst they drink. Along with the tea they eat bread and butter, with slices of hung beef. Coffee is not usual here; they breakfast generally about seven. Their dinner is butter-milk, and bread, to which they sometimes add sugar, then

then it is a delicious dish for them ; or fresh milk and bread ; or boiled or roasted flesh. They sometimes make use of butter-milk instead of fresh milk, to boil a thin kind of porridge with, which tastes very sour, but not disagreeable in hot weather. To each dinner they have a great sallad, prepared with abundance of vinegar, and very little or no oil. They frequently eat butter-milk, bread, and sallad, one mouthful after another. Their supper is generally bread and butter, and milk and bread. They sometimes eat cheese at breakfast, and at dinner ; it is not in slices, but scraped or rasped, so as to resemble coarse flour, which they pretend adds to the good taste of cheese. They commonly drink very small beer, or pure water.

THE governor of *New York* often confers at *Albany*, with the *Indians* of the Five Nations, or the *Iroquese*, (*Mohawks*, *Senekas*, *Cayugaws*, *Onondagoes*, and *Onidoes*) especially when they intend either to make war upon, or to continue a war against the *French*. Sometimes their deliberations likewise turn upon their conversion to the christian religion, and it appears by the answer of one of the *Indian* chiefs, or *Sachems*, to governor *Hunter*, at a conference in this town, that the *English* do not pay
sq

so much attention to a work of so much consequence, as the *French* do, and that they do not send such able men to instruct the *Indians*, as they ought to do *. For after governor *Hunter* had presented these *Indians*, by order of *Queen Anne*, with many clothes, and other presents, of which they were fond, he intended to convince them still more of her Majesty's good-will, and care for them, by adding, *that their good mother, the Queen, had not only generously provided them with fine clothes for their bodies, but likewise intended to adorn their*

* Mr. *Kalm* is, I believe, not right informed. The *French* ecclesiastics have allured some few wretched *Indians* to their religion and interest, and settled them in small villages; but by the accounts of their behaviour, in the several wars of the *French* and *English*, they were always guilty of the greatest cruelties and brutalities; and more so than their heathen countrymen; and therefore it seems that they have been rather perverted than converted. On the other hand, the *English* have translated the bible into the language of the *Virginian Indians*, and converted many of them to the true knowledge of God; and at this present time, the *Indian* charity schools, and missions, conducted by the Rev. Mr. *Eleazar Wheelock*, have brought numbers of the *Indians* to the knowledge of the true God. The society for propagating the gospel in foreign parts, sends every year many missionaries, at their own expence, among the *Indians*. And the *Moravian Brethren* are also very active in the conversion of *Gentiles*; so that if Mr. *Kalm* had considered all these circumstances, he would have judged otherwise of the zeal of the *British* nation, in propagating the gospel among the *Indians*. F.

their souls, by the preaching of the gospel; and that to this purpose some ministers should be sent to them, to instruct them. The governor had scarce ended, when one of the oldest *Sachems* got up, and answered, *that in the name of all the Indians, he thanked their gracions good queen and mother for the fine clothes she had sent them; but that in regard to the ministers, they had already had some among them, (whom he likewise named) who instead of preaching the holy gospel to them, had taught them to drink to excess, to cheat, and to quarrel among themselves.* He then entreated the governor to take from them these preachers, and a number of *Europeans* who resided amongst them; for before they were come among them, the *Indians* had been an honest, sober, and innocent people, but most of them became rogues now. That they had formerly had the fear of God, but that they hardly believed his existence at present. That if he (the governor) would do them any favour, he should send two or three blacksmiths amongst them, to teach them to forge iron, in which they were unexperienced. The governor could not forbear laughing at this extraordinary speech. I think the words of *St. Paul* not wholly unapplicable on
this

this occasion : *For the name of God is blasphemed amongst the Gentiles, through you* †.

June the 21st. About five o'clock in the afternoon we left *Albany*, and proceeded towards *Canada*. We had two men with us, who were to accompany us to the first *French* place, which is *Fort St. Frederick*, or, as the *English* call it, *Crown Point*. For this service each of them was to receive five pounds of *New York* currency, besides which I was to provide them with victuals. This is the common price here, and he that does not choose to conform to it, is obliged to travel alone. We were forced to take up with a canoe *, as we could get neither battoes, nor boats of bark ; and as there was a good road along the west side of the river *Hudson*, we left the men to row forwards, in the canoe, and we went along it on the shore, that we might be better able to examine it, and its curiosities, with greater accuracy. It is very incommodious to row in these canoes ; for one stands at each end and pushes the boat forwards. They commonly keep close to the shore, that they may be able

to

† Romans ii. 24.

* See the description of it, p. 241.

to reach the ground easily. Thus the rowers are forced to stand upright, whilst they row in a canoe. We kept along the shore all the evening, towards the river, it consisted of great hills, and next to the water grew the trees, which I have above mentioned *, and which likewise are to be met with on the shores of the isle, in the river, situate below *Alb. ny.* The easterly shore of the river is uncultivated, woody, and hilly ; but the western is flat, cultivated, and chiefly turned into corn-fields, which had no drains, though they wanted them in some places. It appeared very plainly here, that the river had formerly been broader. For there is a sloping bank on the corn-fields, at about thirty yards distance from the river, with which it always runs parallel. From this it sufficiently appears, that the rising ground formerly was the shore of the river, and the corn-fields its bed. As a further proof, it may be added, that the same shells which abound on the present shore of the river, and are not applied to any use by the inhabitants, ly plentifully scattered on these fields. I cannot say whether this change was occasioned by the diminishing of the
water

* See page 251.

water in the river, or by its washing some earth down the river, and carrying it to its sides, or by the river's cutting deeper in on the sides.

ALL the grounds were ploughed very even, as is usual in the *Swedish* province of *Upland*. Some were sown with *yellow*, and others with *white Wheat*. Now and then we saw great fields of flax, which was now beginning to flower. In some parts it grows very well, and in others it was but indifferent. The excessive drought which had continued throughout this spring, had parched all the grass and plants on hills and high grounds, leaving no other green plant than the common *Mullein* (*Verbascum Thapsus Linn.*) which I saw in several places, on the driest and highest hills, growing in spite of the parching heat of the sun, and though the pastures and meadows were excessively poor, and afforded scarce any food at all, yet the cattle never touched the *Mullein*. Now and then I found fields with pease, but the *Gbarlock*, (*Sinapis arvensis Linn.*) kept them quite under. The soil in most of these fields is a fine mould, which goes pretty deep.

THE wild vines cover all the hills along the rivers, on which no other plants grow, and on those which are covered with trees,



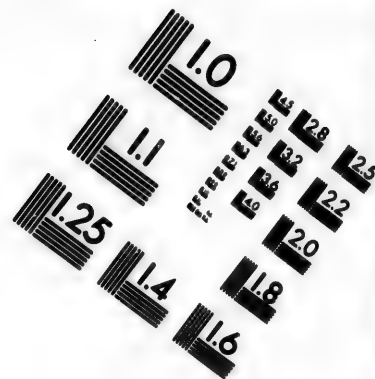
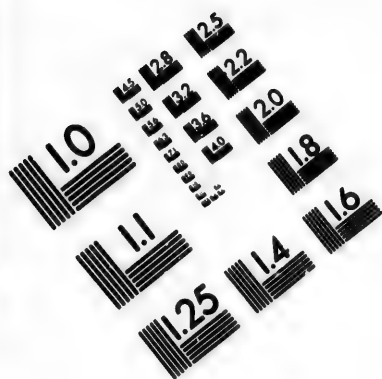
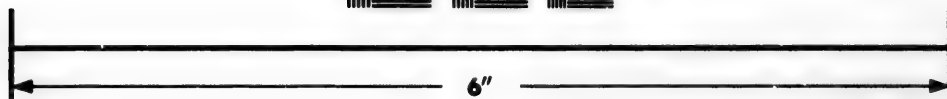
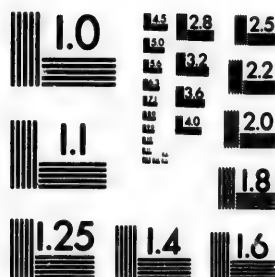


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they climb to the tops of them, and wholly cover them, making them bend down with their weight. They had already large grapes; we saw them abundant all this day, and during all the time that we kept to the river *Hudson*, on the hills, along the shores, and on some little islands in the river.

THE *white-b ck'd Maize-thieves* appeared now and then, flying amongst the bushes: their note is fine, and they are not so large as the black maize-thieves, (*Oriolus Phœniceus*). We saw them near *New York*, for the first time.

WE found a *Water-beech* tree (*Platanus occidentalis*) cut down near the road, measuring about five feet in diameter.

THIS day, and for some days afterwards, we met with islands in the river. The larger ones were cultivated, and turned into corn-fields and meadows.

WE walked about five *English* miles along the river to-day, and found the ground, during that time, very uniform, and consisting of pure earth. I did not meet with a single stone on the fields. The Red Maple, the Water-beech, the Water-asp, the wild Prune-tree, the Sumach, the Elm, the wild Vines, and some species of Willows, were the
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Sheep Fall on the River. Mobmark, 900 feet wide, 75 feet high.

the trees which we met with on the rising shores of the river, where some *Asparagus* (*Asparagus officinalis*) grew wild.

WE passed the night about six miles from Albany, in a countryman's cottage. On the west side of the river we saw several houses, one after another, inhabited by the descendants of the first *Dutch* settlers, who lived by cultivating their grounds. About half an *English* mile beyond our lodgings, was the place where the tide stops in the river *Hudson*, there being only small and shallow streams above it. At that place they catch a good many sorts of fish in the river.

THE barns were generally built in the *Dutch* way, as I have before described them *; for in the middle was the threshing-floor, above it a place for the hay and straw, and on each side stables for horses, cows, and other animals. The barn itself was very large. Sometimes the buildings in the court-yard consist only of a room, and a garret above it, together with a barn upon the above plan.

June the 22d. THIS morning I followed one of our guides to the water-fall near *Cohoes*, in the river *Mohawk*, before it falls

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* See in the first Volume, p. 223, 224.



Cohoes Fall on the River Mohawk, 900 feet wide 75 feet high.

into the river *Hudson*. This fall is about three *English* miles from the place where I passed the night. The country till the fall is a plain, and only hilly about the fall itself. The wood is cleared in most places, and the ground cultivated, and interspersed with farm-houses.

THE *Coboes Fall* is one of the greatest in *North America*. It is in the river *Mohawk*, before it unites with the river *Hudson*. Above and below the fall, the sides and the bottom of the river consist of hard rock. The river is three hundred yards broad here. At the fall there is a rock crossways in the river, running every where equally high, and crossing in a strait line with the side which forms the fall. It represents, as it were, a wall towards the lower side, which is not quite perpendicular, wanting about four yards. The height of this wall, over which the water rolls, appeared to me about twenty or twenty-four yards. I had marked this height in my pocket-book; and afterwards found it agreed pretty well with the account which that ingenious engineer, Mr. *Lewis Evans*, communicated to me at *Philadelphia*. He said, that he had geometrically measured the breadth and height of the fall, and found it nine hundred *English* feet broad,

broad, and seventy-five feet high. The representation of this fall, which is here joined, has been made by Mr. *Evans*. There was very little water in the river at present, and it only ran over the fall in a few places. In such places where the water had rolled down before, it had cut deep holes below into the rock, sometimes to the depth of two or three fathoms. The bed of the river, below the fall, was of rock, and quite dry, there being only a channel in the middle fourteen feet broad, and a fathom or somewhat more deep, through which the water passed which came over the fall. We saw a number of holes in the rock, below the fall, which bore a perfect resemblance to those in *Sweden* which we call *Giants Pots*, or *Mountain Kettles*. They differed in size; there being large deep ones, and small shallow ones. We had clear uninterrupted sun-shine, not a cloud above the horizon, and no wind at all. However, close to this fall, where the water was in such a small quantity, there was a continual drizzling rain, occasioned by the vapours which rose from the water during its fall, and were carried about by the wind. Therefore, in coming within a musket-shot of the fall, against the wind, our cloaths were

wetted at once, as from a rain. The whirlpools, which were in the water below the fall, contained several kinds of fish; and they were caught by some people, who amused themselves with angling. The rocks hereabouts consist of the same black stone which forms the hills about *Albany*. When exposed to the air, it is apt to shiver into horizontal flakes, as slate does.

AT noon we continued our journey to *Canada* in the canoe, which was pretty long, and made out of a white pine. Somewhat beyond the farm where we lay at night, the river became so shallow that the men could reach the ground every where with their oars; it being in some parts not above two feet, and sometimes but one foot deep. The shore and bed of the river consisted of sand and pebbles. The river was very rapid, and against us; so that our rowers found it hard work to get forward against the stream. The hills along the shore consisted merely of soil; and were very high and steep in some parts. The breadth of the river was generally near two musket-shot.

STURGEONS abound in the river *Hudson*. We saw them for several days together leap high up into the air, especially in the evening; our guides, and the people who lived hereabouts, asserted that they never see any
sturgeons

sturgeons in winter time, because these fish go into the sea late in autumn, but come up again in spring and stay in the river all the summer. They are said to prefer the shallowest places in the river, which agreed pretty well with our observations; for we never saw them leap out of the water but in shallows. Their food is said to be several kinds of *conserveæ*, which grow in plenty in some places at the bottom of the river; for these weeds are found in their bellies when they are opened. The *Dutch* who are settled here, and the *Indians*, fish for sturgeons, and every night of our voyage upon this river, we observed several boats with people who struck them with harpoons. The torches which they employed were made of that kind of pine, which they call the black pine here. The nights were exceedingly dark, though they were now shortest, and though we were in a country so much to the South of *Sweden*. The shores of the river lay covered with dead sturgeons, which had been wounded with the harpoon, but escaped, and died afterwards; they occasioned an insupportable stench during the excessive heat of the weather.

As we went further up the river we saw an *Indian* woman and her boy sitting in a

boat of bark, and an *Indian* wading through the river, with a great cap of bark on his head. Near them was an island on which there were a number of *Indians* at present, on account of the sturgeon fishery. We went to their huts to try if we could get one of them to accompany us to *Fort St. Frederic*. On our arrival we found that all the men were gone into the woods a hunting this morning, and we were forced to engage their boys to go and look for them. They demanded bread for payment, and we gave them twenty little round loaves; for as they found that it was of great importance to us to speak with the *Indians*, they raised difficulties, and would not go till we gave them what they wanted. The island belonged to the *Dutch*, who had turned it into corn-fields. But at present they had leased it to the *Indians*, who planted their maize and several kinds of melons on it. They built their huts or *wigwams* on this island, on a very simple plan. Four posts were put into the ground perpendicularly, over which they had placed poles, and made a roof of bark upon them. They had either no walls at all, or they consisted of branches with leaves, which were fixed to the poles. Their beds consisted of deer-skins which were spread on the ground. Their utensils were a couple of small kettles, and
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two ladles, and a bucket or two of bark, made so close as to keep water. The sturgeons were cut into long slices, and hung up in the sunshine to dry, and to be ready against winter. The *Indian* women were sitting at their work on the hill, upon deer-skins. They never make use of chairs, but sit on the ground: however, they do not sit cross-legged, as the *Turks* do, but between their feet, which, though they be turned backwards, are not crossed, but bent outwards. The women wear no head-dress, and have black hair. They have a short blue petticoat, which reaches to their knees, and the brim of which is bordered with red or other ribbands. They wear their shifts over their petticoats. They have large ear-rings: and their hair is tied behind, and wrapped in ribbands. Their *Wampum*, or Pearls, and their money, which is made of shells, are tied round the neck, and hang down on the breast. This is their whole dress. They were now making several kinds of work of skins, to which they sowed the quills of the *American Porcupines*, having dyed them black or red, or left them in their original colour.

TOWARDS evening, we went from hence to a farm close to the river, where we found only one man, looking after the maize and the fields; the inhabitants being not yet returned since the end of the war.

THE

THE little brooks here contain Crawfish, which are exactly the same with ours *, with this difference only, that they are somewhat less; however, the *Dutch* inhabitants will not eat them.

June the 23d. WE waited a good while for the *Indians*, who had promised to come home, in order to shew us the way to *Fort St. Ann*, and to assist us in making a boat of bark, to continue our voyage. About eight o'clock three of the men arrived. Their hair was black, and cut short; they wore rough pieces of woollen cloth, of a bright green colour, on their shoulders, a shirt which covers their thighs, and pieces of cloth, or skins, which they wrap round the legs and part of the thighs. They had neither hats, caps, nor breeches. Two of them had painted the upper part of their foreheads, and their cheeks, with vermilion. Round their neck was a ribband, from which hung a bag down to the breast, containing their knives. They promised to accompany us for thirty shillings; but soon after changed their minds, and went with an *Englistman*, who gave them more. Thus we were obliged to make this journey quite alone. The *Indians*, however, were honest enough to return us fifteen shillings, which we had paid them before-hand.

OUR

* *Cancer Aflacus* Linn.

OUR last night's lodging was about ten *English* miles from *Albany*. During the last war, which was just now ended, the inhabitants had all retreated from thence to *Albany*, because the *French Indians* had taken or killed all the people they met with, set the houses on fire, and cut down the trees. Therefore, when the inhabitants returned, they found no houses, and were forced to ly under a few boards which were huddled together.

THE river was almost a musket-shot broad, and the ground on both sides cultivated. The hills near the river were steep, and the earth of a pale colour.

THE *American Elder* (*Sambucus occidentalis* *) grows in incredible quantities along those hills, which appear quite white, from the abundance of flowers on the Elder.

ALL this day along, we had one current after another, full of stones, which were great obstacles to our getting forward. The water in the river was very clear, and generally shallow, being only from two to four feet deep, running very violently against us in most places. The shore was covered with pebbles, and a grey sand. The hills consisted of earth, were high, and stood perpendicular towards the river, which was near

* *Sambucus Canadensis*

near two musket-shot broad. Sometimes the land was cultivated, and sometimes it was covered with woods.

THE hills near the river abound with red and white clover. We found both these kinds plentiful in the woods. It is therefore difficult to determine whether they were brought over by the *Europeans*, as some people think; or whether they were originally in *America*, which the *Indians* deny.

WE found Purslane (*Portulaca oleracea*) growing plentifully in a sandy soil. In gardens it was one of the worst weeds.

WE found people returning every where to their habitations, which they had been forced to leave during the war.

THE farms were commonly built close to the river, on the hills. Each house has a little kitchen-garden, and a still better orchard. Some farms, however, had large gardens. The kitchen-gardens afford several kinds of gourds, water-melons, and kidney-beans. The orchards are full of apple-trees. This year the trees had few or no apples, on account of the frosty nights which had happened in *May*, and the drought which had continued throughout this summer.

THE

THE houses hereabouts are generally built of beams of wood, and of unburnt bricks dried by the sun and the air. The beams are first erected, and upon them a gable with two walls, and the spars. The wall on the gable is made of boards. The roof is covered with shingles of fir. They make the walls of unburnt bricks, between the beams, to keep the rooms warmer; and that they might not easily be destroyed by rain and air, they are covered with boards on the outside. The cellar is below the house.

THE farms are either built close to the river-side, or on the high grounds; and around them are large fields with maize.

WE saw great numbers of *Musk-Rats* (*Castor Zibethicus* Linn.) on the shores of the river, where they had many holes, some on a level with the surface of the water. These holes were large enough to admit a kitten. Before and in the entrance to the holes, lay a quantity of empty shells, the animals of which had been eaten by the *Musk-Rats* *. They are caught in traps placed along the water-side, and baited with some maize or apples.

THE

* This appears to be a new observation, as *Linnaeus*, *De Buffon*, and *Sarrafin* pretend, they only feed on the *Acorus*, or Reeds, and other roots. F.

THE

THE *Sassafras*-trees abound here, but never grow to any considerable height.

CHESTNUT-TREES appear now and then.

THE *Cockspur Hawthorn* (*Cratægus Crus Galli* Linn.) grows in the poorest soil, and has very long spines; which shews, that it may be very advantageously planted in hedges, especially in a poor soil.

THIS night we lodged with a farmer, who had returned to his farm after the war was over. All his buildings, except the great barn, were burnt.

JUNE the 24th. THE farm where we passed the night was the last in the province of *New York*, towards *Canada*, which had been left standing, and which was now inhabited. Further on, we met still with inhabitants: but they had no houses, and lived in huts of boards; the houses being burnt during the war.

As we continued our journey, we observed the country on both sides of the river to be generally flat, but sometimes hilly; and large tracts of it are covered with woods of fir-trees. Now and then we found some parts turned into corn-fields and meadows; however, the greater part was covered with woods. Ever since we left *Albany*, almost half-way to *Saratoga*, the river runs very rapid; and it cost us a deal

deal of pains to get upwards. But afterwards it becomes very deep, for the space of several miles; and the water moves very slowly. The shores are very steep, though they are not very high. The river is two musket-shot broad. In the afternoon it changed its direction; for hitherto its direction was from North to South, but now it came from N. N. E. to S. S. W. and sometimes from N. E. to S. W.

ANTHILLS are very scarce in *America*; and I do not remember seeing a single one before I came to the *Coboes Fall*. We observed a few in the woods to-day. The Ants were the same with our common red ones (*Formica rufa* Linn.) The Ant-hills consist chiefly of the slate-like mouldered stone which abounds here, there being nothing else for them.

CHESTNUT-TREES grew scattered in the woods. We were told, that Mulberry-trees (*Morus rubra* Linn.) likewise grow wild here, but rather scarce; and this is the most northerly place where they grow in *America*; at least, they have not been observed further to the north. We met with wild parsnep every day; but commonly in such places where the land was or had been cultivated. Hemp grows spontane-

spontaneously, and in great abundance, near old plantations.

THE woods abound with *Woodlice*, which were extremely troublesome to us.

THE *Thuya occidentalis* Linn. appeared along the shores of the river. I had not seen it there before.

THE trees which grow along the shores, and on the adjacent hills, within our sight to-day, are elms, birches, white firs, alders, dog-trees, lime-trees, red willows, and chestnut-trees. The *American Elder*, (*Sambucus Canadensis* Linn.) and the wild vines, only appear in places where the ground has been somewhat cultivated, as if they were desirous of being the companions of men. The lime-trees and white walnut-trees are the most numerous. The horn-beams, with inflated cones, (*Carpinus Ostrya* Linn.) appeared now and then ; but the water-beech and water-poplar never came within sight any more.

WE frequently saw ground-squirrels and black squirrels in the woods.

AT a little distance from *Saratoga*, we met two *Indians* in their boats of bark, which could scarce contain more than one person.

NEAR *Saratoga* the river becomes shallow
and

and rapid again. The ground is here turned into corn-fields and meadows, but on account of the war, it was not made use of.

SARATOGA has been a fort built of wood by the *English*, to stop the attacks of the *French Indians* upon the *English* inhabitants in these parts, and to serve as a rampart to *Albany*. It is situated on a hill, on the east-side of the river *Hudson*, and is built of thick posts driven in to the ground, close to each other, in the manner of palisades, forming a square, the length of whose sides was within the reach of a musket-shot. At each corner are the houses of the officers, and within the palisades are the barracks, all of timber. This fort has been kept in order and was garrisoned till the last war, when the *English* themselves in 1747 set fire to it, not being able to defend themselves in it against the attacks of the *French* and their *Indians*; for as soon as a party of them went out of the fort, some of these enemies lay concealed, and either took them all prisoners, or shot them.

I SHALL only mention one, out of many artful tricks which were played here, and which both the *English* and *French* who were present here at that time, told me repeatedly. A party of *French*, with their

Indians, concealed themselves one night in a thicket near the fort. In the morning some of their *Indians*, as they had previously resolved, went to have a nearer view of the fort. The *English* fired upon them, as soon as they saw them at a distance ; the *Indians* pretended to be wounded, fell down, got up again, ran a little way, and dropped again. Above half the garrison rushed out to take them prisoners ; but as soon as they were come up with them, the *French* and the remaining *Indians* came out of the bushes, betwixt the fortrefs and the *English*, surrounded them, and took them prisoners. Those who remained in the fort had hardly time to shut the gates, nor could they fire upon the enemy, because they equally exposed their countrymen to danger, and they were vexed to see their enemies take and carry them off in their sight and under their cannon. Such *French* artifices as these made the *English* weary of their ill-planned fort. We saw some of the palisades still in the ground. There was an island in the river, near *Saratoga*, much better situated for a fortification. The country is flat on both sides of the river near *Saratoga*, and its soil good. The wood round about was generally cut down. The shores of the river are high, steep, and consist of earth. We saw some hills

hills in the north, beyond the distant forests. The inhabitants are *Dutch*, and bear an inveterate hatred to all *Englishmen*.

WE lay over night in a little hut of boards erected by the people who were come to live here.

June the 25th. SEVERAL saw-mills were built here before the war, which were very profitable to the inhabitants, on account of the abundance of wood which grows here.

THE boards were easily brought to *Albany*, and from thence to *New York*, in rafts every spring with the high water; but all the mills were burnt at present.

THIS morning we proceeded up the river, but after we had advanced about an *English* mile, we fell in with a water-fall, which cost us a deal of pains before we could get our canoe over it. The water was very deep just below the fall, owing to its hollowing the rock out by the fall. In every place where we met with rocks in the river, we found the water very deep, from two to four fathoms and upwards; because by finding a resistance it had worked a deeper channel into the ground. Above the fall, the river is very deep again, the water slides along silently, and increases suddenly near the shores. On both sides till you come to Fort *Nicholson*, the shore is covered with tall

trees. After rowing several miles, we passed another water-fall, which is longer and more dangerous than the preceding one.

GIANTS-POTS *, which I have described in the memoirs of the Royal *Swedish* Academy of Sciences, are abundant near the fall of the rock which extends across the river. The rock was almost dry at present, the river containing very little water at this season of the year. Some of the giants-pots were round, but in general they were oblong. At the bottom of most of them lay either stones or grit, in abundance. Some were fifteen inches in diameter, but some were less. Their depth was likewise different, and some that I observed were above two foot deep. It is plain that they owed their origin to the whirling of the water round a pebble, which by that means was put in motion, together with the sand.

WE intended to have gone quite up to Fort *Nicholson* in the canoe, which would have been a great convenience to us; but we found it impossible to get over the upper fall, the canoe being heavy, and scarce any water in the river, except in one place where it flowed over the rock, and where it was impossible to get up, on account of the steep-

* This is the literal meaning of the *Swedish* word *jätte grytor*. See the memoirs of the *Swed. Acad. of Sciences* for the year 1743, p. 122. and Kalm's vol. 1. p. 121.

steepness, and the violence of the fall. We were accordingly obliged to leave our canoe here, and to carry our baggage through unfrequented woods to Fort *Anne*, on the river *Woodcreek*, which is a space from forty-three to fifty *Englisch* miles, during which we were quite spent, through the excess of heat. Sometimes we had no other way of crossing deep rivers, than by cutting down tall trees, which stood on their banks, and throwing them across the water. All the land we passed over this afternoon was almost level, without hills and stones, and entirely covered with a tall and thick forest, in which we continually met with trees which were fallen down, because no one made the least use of the woods. We passed the next night in the midst of the forest, plagued with muskitoes, gnats, and woodlice, and in fear of all kinds of snakes.

June the 26th. EARLY this morning we continued our journey through the wood, along the river *Hudson*. There was an old path leading to Fort *Nicholson*, but it was so overgrown with grass, that we discovered it with great difficulty. In some places we found plenty of *raspberries*, some of which were already ripe.

FORT *Nicholson* is the place on the eastern shore of the river *Hudson*, where a

wooden fortification formerly stood. We arrived here some time before noon, and rested a while. Colonel *Lydius* resided here till the beginning of the last war, chiefly with a view of carrying on a greater trade with the *French Indians*; but during the war, they burnt his house, and took his son prisoner. The fort was situated on a plain, but at present the place is all overgrown with a thicket. It was built in the year 1709, during the war which Queen *Anne* carried on against the *French*, and it was named after the brave *English* general *Nicholson*. It was not so much a fort, as a magazine to Fort *Anne*. In the year 1711, when the *English* naval attempt upon *Canada* miscarried, the *English* themselves set fire to this place. The soil hereabouts seems to be pretty fertile. The river *Hudson* passed close by here.

SOME time in the afternoon, we continued our journey. We had hitherto followed the eastern shore of the river *Hudson*, and gone almost due North; but now we left it, and went E. N. E. or N. E. across the woods, in order to come to the upper end of the river *Woodcreek*, which flows to Fort St. *Frederic*, where we might go in a boat from the former place. The ground we passed over this
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afternoon was generally flat, and somewhat low. Now and then we met with rivulets, which were generally dried up during this season. Sometimes we saw a little hill, but neither mountains nor stones, and the country was every where covered with tall and thick forests. The trees stood close, and afforded a fine shade; but the pleasure which we enjoyed from it was lessened by the incredible quantity of gnats which fill the woods. We found several plants here, but they were far from each other, (as in our woods where the cattle have destroyed them,) though no cattle ever came here. The ground was every where thick covered with leaves of the last autumn. In some places we found the ground over-grown with great quantities of moss. The soil was generally very good, consisting of a deep mould, in which the plants thrive very well. Therefore it seems that it would answer very well if it were cultivated: however, flowing waters were very scarce hereabouts; and if the woods were cleared, how great would be the effects of the parching heat of the sun, which might then act with its full force!

WE lodged this night near a brook, in order to be sufficiently supplied with water,

which was not every where at hand during this season. The muskitoes, punchins or gnats, and the woodlice, were very troublesome. Our fear of snakes, and of the *Indians*, rendered this night's rest very precarious and unsecure.

PUNCHINS, as the *Dutch* call them, are the little gnats (*Culex pulicaris* Linn.) which abound here. They are very minute, and their wings grey, with black spots. They are ten times worse than the larger ones, (*Culex pipiens* Linn.) or muskitoes; for their size renders them next to imperceptible; they are every where careless of their lives, suck their fill of blood, and cause a burning pain.

WE heard several great trees fall of themselves in the night, though it was so calm, that not a leaf stirred. They made a dreadful cracking.

June the 27th. WE continued our journey in the morning. We found the country like that which we passed over yesterday, except meeting with a few hills. Early this morning we plainly heard a fall in the river *Hudson*.

IN every part of the forest we found trees thrown down either by storms, or age; but none were cut down, there being no inhabitants; and though the wood is
very

very fine, yet nobody makes use of it. We found it very difficult to get over such trees, because they had stopped up almost all the passages, and close to them was the chief residence of rattle-snakes, during the intenseness of the heat.

ABOUT two o'clock this afternoon we arrived at Fort *Anne*. It lies upon the river *Woodcreek*, which is here at its origin no bigger than a little brook. We stayed here all this day, and next, in order to make a new boat of bark, because there was no possibility to go down the river to Fort St. *Frederic*, without it. We arrived in time, for one of our guides fell ill this morning, and could not have gone any further with his burthen. If he had been worse, we should have been obliged to stop on his account, which would have put us under great difficulties, as our provisions would soon have been exhausted, and from the desert place where we were, we could not have arrived at any inhabited place in less than three or four days. Happily we reached the wish'd-for place, and the sick man had time to rest and recover.

ABOUT Fort *Anne* we found a number of mice, of the common kind. They were probably the offspring of those which were brought to the fort in the soldier's provisions,

sions, at the time when it was kept in a state of defence.

WE met with some apple and plumb-trees, which were certainly planted when the fort was in a good condition.

June the 28th. THE *American Elm*, (*Ulmus Americana Linn.*) grows in abundance, in the forests hereabouts. There are two kinds of it. One was called the *White Elm*, on account of the inside of the tree being white. It was more plentiful than the other species, which was called the *Red Elm*, because the colour of the wood was reddish. Of the bark of the former the boats made use of here are commonly made, it being tougher than the bark of any other tree. With the bark of hiccory, which is employed as baste, they sew the elm-bark together, and with the bark of the red elm they join the ends of the boat so close as to keep the water out. They beat the bark between two stones; or for want of them, between two pieces of wood.

THE making of the boat took up half yesterday, and all this day. To make such a boat, they pick out a thick tall elm, with a smooth bark, and with as few branches as possible. This tree is cut down, and great care is taken to prevent the bark from being hurt by falling against other trees,
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or against the ground. With this view some people do not fell the trees, but climb to the top of them, split the bark, and strip it off, which was the method our carpenter took. The bark is split on one side, in a strait line along the tree, as long as the boat is intended to be ; at the same time, the bark is carefully cut from the stem a little way on both sides of the slit, that it may more easily separate ; the bark is then peeled off very carefully, and particular care is taken not to make any holes into it ; this is easy when the sap is in the trees, and at other seasons the tree is heated by the fire, for that purpose. The bark thus stripped off is spread on the ground, in a smooth place, turning the inside downwards, and the rough outside upwards, and to stretch it better, some logs of wood or stones are carefully put on it, which press it down. Then the sides of the bark are gently bent upwards, in order to form the sides of the boat ; some sticks are then fixed into the ground, at the distance of three or four feet from each other, in the curve line, in which the sides of the boat are intended to be, supporting the bark intended for the sides ; the sides of the bark are then bent in the form which the boat is to have, and according to that the sticks are either put nearer

or

or further off. The ribs of the boat are made of thick branches of hiccory, they being tough and pliable. They are cut into several flat pieces, about an inch thick, and bent into the form which the ribs require, according to their places in the broader or narrower part of the boat. Being thus bent, they are put across the boat, upon the back, or its bottom, pretty close, about a span, or ten inches from each other. The upper edge on each side of the boat is made of two thin poles, of the length of the boat, which are put close together, on the side of the boat, being flat, where they are to be joined. The edge of the bark is put between these two poles, and sewed up with threads of bast, of the mouse-wood, or other tough bark, or with roots. But before it is thus sewed up, the ends of the ribs are likewise put between the two poles on each side, taking care to keep them at some distance from each other. After that is done, the poles are sewed together, and being bent properly, both their ends join at each end of the boat, where they are tied together with ropes. To prevent the widening of the boat at the top, three or four transverse bands are put across it, from one edge to the other, at the distance of thirty or forty inches from each

each other. These bands are commonly made of hiccory, on account of its toughness and flexibility, and have a good length. Their extremities are put through the bark on both sides, just below the poles, which make the edges; they are bent up above those poles, and twisted round the middle part of the bands, where they are carefully tied by ropes. As the bark at the two ends of the boat cannot be put so close together as to keep the water out, the crevices are stopped up with the crushed or pounded bark of the red elm, which in that state looks like oakum. Some pieces of bark are put upon the ribs in the boat, without which the foot would easily pierce the thin and weak bark below, which forms the bottom of the boat, for the better security of which, some thin boards are commonly laid at the bottom, which may be trod upon with more safety. The side of the bark which has been upon the wood, thus becomes the outside of the boat, because it is smooth and slippery, and cuts the water with less difficulty than the other. The building of these boats is not always quick; for sometimes it happens that after peeling the bark off an elm, and carefully examining it, it is found pierced with holes and splits, or it is too thin to venture

venture one's life in. In such a case another elm must be looked out ; and it sometimes happens that several elms must be stripped of their bark, before one is found fit for a boat. That which we made was big enough to bear four persons, with our baggage, which weighed somewhat more than a man.

ALL possible precautions must be taken in rowing on the rivers and lakes of these parts with a boat of bark. For as the rivers, and even the lakes, contain numbers of broken trees, which are commonly hidden under the water, the boat may easily run against a sharp branch, which would tear half the boat away, if one rowed on very fast, exposing the people in it to great danger, where the water is very deep, especially if such a branch held the boat.

To get into such a dangerous vessel, must be done with great care, and for the greater safety, without shoes. For with the shoes on, and still more with a sudden leap into the boat, the heels may easily pierce through the bottom of the boat, which might sometimes be attended with very disagreeable circumstances, especially when the boat is so near a rock, and close to that a sudden depth of water ; and such places are common in the lakes and rivers here.

I never saw the muskitoes (*Culex pipiens*) more plentiful in any part of *America* than they are here. They were so eager for our blood, that we could not rest all the night, though we had surrounded ourselves with fire.

WOOD-LICE (*Acarus Americanus* Linn.) abound here, and are more plentiful than on any part of the journey. Scarcely any one of us sat down but a whole army of them crept upon his clothes. They caused us as much inconvenience as the gnats, during the last night, and the short time we stayed here. Their bite is very disagreeable, and they would prove very dangerous, if any one of them should creep into a man's ear, from whence it is difficult to extract them. There are examples of people whose ears were swelled to the size of the fist, on account of one of these insects creeping into them, and biting them. More is said about them in the description which I have given to the Royal Swedish Academy of Sciences*.

THE *Whipperiwill*, or *Whip-poor-Will* cried all night on every side. The *Fire-flies* flew in numbers through the woods at night.

FORT

* See the Memoirs of the Royal Academy for the year 1754, page 19, &c.

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FORT *Anne* derives its name from *Queen Anne*; for in her time it served as a fortification against the *French*. It lies on the western side of the river *Woodcreek*, which is here as inconsiderable as a brook, of a fathom's breadth, and may be waded through in any part, during this season. The fort is built in the same manner as the forts *Saratoga* and *Nicholson*, that is to say, of palisades, within which the soldiers were quartered, and at the corners of which were the lodgings of the officers. The whole consisted of wood, because it was erected only with a view to resist irregular troops. It is built on a little rising ground which runs obliquely to the river *Woodcreek*. The country round about it is partly flat, partly hilly, and partly marshy, but it consists merely of earth, and no stones are to be met with, though ever so carefully sought for. General *Nicholson* built this fort in the year 1709; but at the conclusion of the war, then carrying on against the *French*, it shared the same fate with *Saratoga* and Fort *Nicholson*, being burnt by the *English* in 1711. This happened with the following circumstance: In 1711 the *English* resolved to attack *Canada*, by land and by sea, at the same time. A powerful *English* fleet sailed up the river

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St. Lawrence to besiege *Quebec*, and General *Nicholson*, who was the greatest promoter of this expedition, headed a numerous army to this place by land, to attack *Montreal*, at the same time from hence ; but a great part of the *English* fleet was shipwrecked in the river *St. Lawrence*, and obliged to return to *New England*. The news of this misfortune was immediately communicated to General *Nicholson*, who was advised to retreat. Captain *Butler*, who commanded *Fort Mohawk*, during my stay in *America*, told me that he had been at *Fort Anne* in 1711, and that General *Nicholson* was about to leave it, and go down the river *Woodcreek*, in boats ready for that purpose, when he received the accounts of the disaster which befel the fleet. He was so enraged, that he endeavoured to tear his wig, but it being too strong for him, he flung it to the ground, and trampled on it, crying out *Roguery, treachery*. He then set fire to the fort, and returned. We saw the remains of the burnt palisades in the ground ; and I asked my guides, Why the *English* had been at so great an expence in erecting the fort, and why they afterwards burnt it without any previous consideration ? They replied, that it was done to get money from the government once

more, for the rebuilding of the fort, which money coming into some people's hands, they would appropriate a great part of it to themselves, and erect again a wretched, inconsiderable fort. They further told me, that some of the richest people in *Albany* had promoted their poor relations to the places for supplying the army with bread, &c. with a view to patch up their broken fortunes; and that they had acquired such fortunes as rendered them equal to the richest inhabitants of *Albany*.

THE heat was excessive to-day, especially in the afternoon, when it was quite calm. We were on the very spot where Fort *Anne* formerly stood; it was a little place free from trees, but surrounded with them on every side, where the sun had full liberty to heat the air. After noon it grew as warm as in a hot bath*, and I never felt a greater

* In *Sweden* and in *Russia* it is usual for people of all ranks to bathe every week at least one time; this is done in a stove heated by an oven, to a surprising degree, and which is enough to souse people who are not used to it: for commonly the heat is increased by the hot steam, caused by throwing red hot stones into water. In these baths, in *Russia*, the lower sort of people, men and women, bathe promiscuously, as the *Romans* did, and from whom, as *Plutarch* observes, in his *Life of Cato*, the *Greeks* adopted this indelicate and indecent custom, and which spread so much, that the Emperor *Adrian*, and
Marcus

greater heat. I found a difficulty of breathing, and it seemed to me as if my lungs could not draw in a sufficient quantity of air. I was more eased when I went down into the vallies, and especially along the *Wood-creek*. I tried to fan the air to me with my hat; but it only encreased the difficulty of breathing, and I received the greatest relief when I went to the water, and in a shady place frequently sprinkled some water in the air. My companions were all very much weakened, but they did not find such difficulty in breathing, as I had done; however towards evening the air became somewhat cooler.

June the 29th. HAVING compleated our boat, after a great deal of trouble, we continued our journey this morning. Our provisions, which were much diminished, obliged us to make great haste; for by

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Marcus Antoninus were obliged to make laws against it, but neither were they long observed, for we find soon the *Council of Laodicea* obliged to prescribe a canon against this brutal custom, and notwithstanding this we find soon after that not only persons of all ranks, but even clergymen and monks bathed promiscuously with women, in the same baths; and from thence, it is probable, this custom passed among the *Russians*, when christianity took place among them. Near the bath, in *Russia*, is commonly a pond, where the people plunge in, when quite hot, and in winter they welter in the snow; and *Saturdays* it is common to see before the bath naked men and women, each having a bundle of rods in their hand; with which they gently beat one another, when in the bath. F.

being obliged to carry every thing on our backs, through the woods to Fort *Anne*, we could not take a great quantity of provisions with us, having several other very necessary things with us; and we did always eat very heartily. As there was very little water in the river, and several trees were fallen across it, which frequently stopped the boat, I left the men in the boat, and went along the shore with *Yungstroem*. The ground on both sides of the river was so low, that it must be under water in spring and autumn. The shores were covered with several sorts of trees, which stood at moderate distances from each other, and a great deal of grass grew between them. The trees afforded a fine shade, very necessary and agreeable in this hot season; but the pleasure it gave was considerably lessened by the numbers of gnats which we met with. The soil was extremely rich.

As we came lower down the river, the dykes, which the beavers had made in it, produced new difficulties. These laborious animals had carried together all sorts of boughs and branches, and placed them across the river, putting mud and clay in betwixt them, to stop the water. They had bit off the ends of the branches as
neatly

neatly as if they had been chopped off with a hatchet. The grass about these places was trod down by them, and in the neighbourhood of the dykes we sometimes met with paths in the grass, where the beavers probably carried trees along. We found a row of dykes before us, which stopped us a considerable while, as we could not get forwards with the boat, till we had cut through them.

As soon as the river was more open, we got into the boat again, and continued our journey in it. The breadth of the river, however, did not exceed eight or nine yards, and frequently it was not above three or four yards broad, and generally so shallow, that our boat got on with difficulty. Sometimes it acquired such a sudden depth, that we could not reach the ground with sticks of seven feet length. The stream was very rapid in some places, and very slow in others. The shores were low at first, but afterwards remarkably high and steep, and now and then a rock projected into the water, which always caused a great depth in such places. The rocks consisted here of a grey quartz, mixed with a grey limestone, lying in strata. The water in the river was very clear and transparent, and we saw several little

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paths

paths leading to it from the woods, said to be made by beavers, and other animals, which resorted here to drink. After going a little more than three *English* miles, we came to a place, where a fire was yet burning, and then we little thought that we had narrowly escaped death last night, as we heard this evening. Now and then we met with several trees lying across the river, and some dykes of beavers, which were troublesome to us.

TOWARDS night we met with a *French* serjeant, and six *French* soldiers, who were sent by the commander of Fort St. *Frederic*, to accompany three *Englishmen* to *Saratoga*, and to defend them in case of necessity, against six *French Indians*, who were gone to be revenged on the *English*, for killing the brother of one of them in the last war. The peace was already concluded at that time, but as it had not yet been proclaimed in *Canada*, the *Indians* thought they could take this step; therefore they silently got away, contrary to the order of the Governor of *Montreal*, and went towards the *English* plantations. We here had occasion to admire the care of Providence for us, in escaping these barbarians. We found the grass trod down all the day along, but had no thoughts of danger,

ger, as we believed that every thing was quiet and peaceable. We were afterwards informed, that these *Indians* had trod the grass down, and passed the last night in the place where we found the burning brands in the morning. The usual road which they were to take, was by Fort *Anne*, but to shorten their journey they had gone an unfrequented road. If they had gone on towards Fort *Anne*, they would have met us without doubt, and looking upon us all as *Englishmen*, for whose blood they were gone out, they could easily have surprised and shot us all, and by that means have been rid of the trouble of going any further to satisfy their cruelty. We were greatly struck when the *Frenchmen* told us how near death we had been to-day. We passed the night here, and though the *French* repeatedly advised and desired me not to venture any further with my company, but to follow them to the first *English* settlement, and then back to Fort *St. Frederic*, yet I resolved, with the protection of the Almighty, to continue my journey the next day.

WE saw immense numbers of those wild pigeons flying in the woods, which sometimes come in incredible flocks to the southern *English* colonies, most of the in-

bitants not knowing where they come from. They have their nests in the trees here ; and almost all the night make a great noise and cooing in the trees, where they roost. The *Frenchmen* shot a great number of them, and gave us some, in which we found a great quantity of the seeds of the elm, which evidently demonstrated the care of Providence in supplying them with food ; for in *May* the seeds of the red maple, which abounds here, are ripe, and drop from the trees, and are eaten by the pigeons during that time : afterwards, the seeds of the elm ripen, which then become their food, till other seeds ripen for them. Their flesh is the most palatable of any bird's flesh I ever tasted,

ALMOST every night, we heard some trees crack and fall, whilst we lay here in the wood, though the air was so calm that not a leaf stirred. The reason of this breaking I am totally unacquainted with. Perhaps the dew loosens the roots of trees at night ; or, perhaps there are too many branches on one side of the tree. It may be, that the above-mentioned wild pigeons settle in such quantities on one tree as to weigh it down ; or perhaps the tree begins to bend more and more to one side, from its center of gravity, making the weight always greater
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for the roots to support, till it comes to the point, when it can no longer be kept upright, which may as well happen in the midst of a calm night as at any other time. When the wind blows hard, it is reckoned very dangerous to sleep or walk in the woods, on account of the many trees which fall in them; and even when it is very calm, there is some danger in passing under very great and old trees. I was told, in several parts of *America*, that the storms or hurricanes sometimes only pass over a small part of the woods, and tear down the trees in it; and I have had opportunities of confirming the truth of this observation, by finding places in the forests, where almost all the trees were thrown down, and lay all in one direction.

TEA is differently esteemed by different people; and I think we would be as well, and our purses much better, if we were both without tea and coffee. However, I must be impartial, and mention in praise of tea, that if it be useful, it must certainly be so in summer, on such journeys as mine, through a desert country, where one cannot carry wine or other liquors, and where the water is generally unfit for use, as being full of insects. In such cases, it is very relishing when boiled, and tea is drunk with it; and

and I cannot sufficiently describe the fine taste it has in such circumstances. It relieves a weary traveller more than can be imagined, as I have myself experienced, together with a great many others who have travelled through the desert forests of *America*; on such journeys, tea is found to be almost as necessary as victuals*.

June the 30th. THIS morning we left our boat to the *Frenchmen*, who made use of it to carry their provisions; for we could not make any further use of it, on account of the number of trees which the *French* had thrown across the river during the last war, to prevent the attacks of the *English* upon *Manana*. The *Frenchmen* gave us leave to make use of one of their boats, which they had left behind them, about six miles from the place where we passed the last night. Thus we continued our journey on foot, along the river; and found the country flat, with some little vales here and there. It was every where covered with tall trees, of the deciduous kind; among which the beech, the elm, the *American* lime-tree, and the sugar-maple, were the most

* On my travels through the desert plains, beyond the river *Volga*, I have had several opportunities of making the same observations on Tea; and every traveller, in the same circumstances, will readily allow them to be very just. F.

most numerous. The trees stand at some distance from each other; and the soil in which they grow is extremely rich.

AFTER we had walked about a *Swedish* mile, or six *English* miles, we came to the place where the six *Frenchmen* had left their bark boats, of which we took one, and rowed down the river, which was now between nineteen and twenty yards broad. The ground on both sides was very smooth, and not very high. Sometimes we found a hill consisting of grey quartz, mixed with small fine grains of grey spar. We likewise observed black stripes in it; but they were small, that I could not determine whether they were of glimmer, or of another kind of stone. The hills were frequently divided into strata, lying one above another, of the thickness of five inches. The strata went from north to south; and were not quite horizontal, but dipping to the north. As we went further on, we saw high and steep hills on the river-side, partly covered with trees; but in other parts, the banks consist of a swampy turf ground, which gave way when it was walked upon, and had some similarity to the sides of our marshes, which my countrymen are now about to drain. In those parts where the ground was low and flat, we did not see any stones

stones either on the ground, or on the softer shore; and both sides of the river when they were not hilly, were covered with tall elms, *American* lime-trees, sugar-maples, beeches, hiccory-trees, some water-beeches, and white walnut-trees.

ON our left we saw an old fortification of stones laid above one another; but nobody could tell me whether the *Indians* or the *Europeans* had built it.

WE had rowed very fast all the afternoon, in order to get forward; and we thought that we were upon the true road, but found ourselves greatly mistaken: for towards night we observed, that the reeds in the river bent towards us, which was a mark that the river likewise flowed towards us; whereas, if we had been on the true river, it should have gone with us. We likewise observed, from the trees which lay across the river, that nobody had lately passed that way, though we should have seen the steps of the *Frenchmen* in the grass along the shore, when they brought their boat over these trees. At last, we plainly saw that the river flowed against us, by several pieces of wood which floated slowly towards us; and we were convinced, that we had gone twelve *English* miles, and upwards, upon a wrong river, which obliged us to return, and to row till
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very late at night. We sometimes thought, through fear, that the *Indians*, who were gone to murder some *English*, would unavoidably meet with us. Though we rowed very fast, yet we were not able to-day to get half-way back to the place where we first left the true river.

THE most odoriferous effluvia sometimes came from the banks of the river, towards night, but we could not determine what flowers diffused them. However, we supposed they chiefly arose from the *Asclepias Syriaca*, and the *Apocynum androsaemifolium*.

THE *Musk-Rats* could likewise be smelled at night. They had many holes in the shores, even with the surface of the water.

WE passed the night in an island, where we could not sleep on account of the gnats. We did not venture to make a fire, for fear the *Indians* should find us out, and kill us. We heard several of their dogs barking in the woods, at a great distance from us, which added to our uneasiness.

METEORO-

METEOROLOGICAL OBSERVATIONS.

ADVERTISEMENT.

IN the first column of these tables, the Reader will find the days of the month; in the second, the time or hour of the day, when the observations were made; in the third, the rising and falling of the thermometer; in the fourth, the wind; and in the fifth, the weather in general, such as rainy, fair, cloudy, &c.

THE thermometer which I have made use of is that of Mr. *Celsius*, or the *Swedish* thermometer so called, as I have already pointed out in the preface. To distinguish the degrees above freezing-point from those below it, I have expressed the freezing-point itself by 00, and prefixed 0 to every

degree below it. The numbers therefore which have no 0 before them, signify the upper degrees. Some examples will make this still more intelligible. On the 17th of *December* it is remarked, that the thermometer, at eight o'clock in the morning, was at 02.5. It was therefore at 2 degrees and $\frac{1}{2}$, or half a degree, below the freezing-point; but at two in the afternoon, it was at 00.0, or exactly upon the freezing-point. If it had been 00.3, it would have signified that the thermometer was fallen $\frac{3}{10}$ of a degree below the freezing-point; but 0.3 would signify, that it was risen $\frac{3}{10}$ of a degree above the freezing-point. Thus likewise 03.0. is three degrees below the freezing-point; and 4.0. four degrees above it.

THE numbers in the columns of the winds signify as follows: 0, is a calm; 1, a gentle breeze; 2, a fresh gale; 3, a strong gale; and 4, a violent storm or hurricane. When, in some of the last tables, the winds are only marked once a day, it signifies that they have not changed that day. Thus, on the 21st of *December*, stands N. 0 fair. This shews that the weather-cocks have turned to the north all day; but that no wind has been felt, and the sky has been clear all the day long.

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BEFORE I went to *Canada* in summer 1749, I desired Mr. *John Bartram* to make some meteorological observations in *Pennsylvania*, during my absence, in order to ascertain the summer-heat of that province. For that purpose, I left him a thermometer, and instructed him in the proper use of it; and he was so kind as to write down his observations at his farm, about four *English* miles to the south of *Philadelphia*. He is very excusable for not putting down the hour, the degree of wind, &c. for being employed in business of greater consequence, that of cultivating his grounds, he could not allow much time for this. What he has done, is however sufficient to give an idea of the *Pennsylvanian* summer.

August

D.	H.	Ther	Wind.	The Weather in general.
1	5 m	20.0	E S E 2	Fair.
	2 a	24.5	E 2	
2	5 m	22.0	E 2	
	2 a	24.5	E 2	
3	5 m	22.0	E 1	
	2 a	25.5	SS W 1	Cloudy with some rain.
4	5 m	22.0	S 1	Alternately fair, cloudy and rainy all day.
	1 a	21.0	S 1	
5	5 m	17.0	SS W 1	Chiefly rainy.
6	7 m	17.0	S 2	Cloudy.
	2 a	19.0	S 2	Somewhat cloudy, but chiefly fair.
7	5 m	15.5	SS W 2	Alternately fair and cloudy.
8	5 m	18.0	SS W 0	Fair all day.
	3 a	19.0	SS W 0	
9	6 m	17.5	WN W 0	
	4 a	21.0	WN W 1	
10	6 m	18.5	E 1	Fair.
	3 a	20.5	E 1	
11	6 m	47.0	E N E 1	Somewhat cloudy.
	1 a	18.5	S W 1	Fair.
	4	22.0	S W 1	
	6	22.0	W 3	
12	6 m	16.0	N W 1	Cloudy with some drizzl. rain at ten.
	4 a	19.0	N W 1	Cloudy, fair, some drizzl. rain altern.
13	6 m	17.0	WN W 2	Cloudy with some rain; foggy, sometimes fair.
	2 a	18.5	WN W 2	
14	5 m	18.0	W S W 0	Somewhat cloudy, fair from 11 m. to 3 a.
	4 a	20.0	W S W 0	Cloudy.
15	5 m	18.0	W S W 0	Cloudy; sometimes fair; at ten o'clock fell a thin fog.
	2 a	19.5	N E 2	
16	6 m	18.3	N N E 2	Somewhat cloudy; sometime fair.
	2 a	18.5		Dark; rainy at night.
17	6 m	18.5	E N E 2	Dark, with some drizzling rain.
	2 a	19.5		Drizzling rain all the afternoon.
18	6 m	19.0	E 2	Drizzling rain all the day.
	2 a	20.5		
19	6 m	19.5		Cloudy.
	2 a	20.0		Scattered clouds.

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August

D.	H.	Ther	Wind.	The Weather in general.
20	6 m	19.5		Fair.
	2 a	21.5		Scattered clouds : sometimes rain.
21	6 m	20.8	E 1	Somewhat cloudy, fair at nine
	2 a	21.3		Thin clouds.
22	5 m	21.0		Fair; about twelve it became cloudy.
	1 a	23.5	E S E 1	Cloudy.
23	5 m	22.2		Scattered clouds.
	7		S E 2	
	2 a	24.2		Scattered clouds, dark towards eve.
24	5 m	23.5	W S W 2	Violent rain.
	6		W 2	
	7		W N W 1	About seven it cleared up.
	9		N W 1	
	2 a			Scattered clouds.
25	6 m	24.5	W 1	Scattered clouds.
	10		W N W 3	
	2 a	23.5		
26	6 m	24.0	W 2	Fair. At night a great halo appeared round the sun.
	2 a	24.5	S W 2	Dark. A strong redness at sun-setting.
			W S W 1	Cloudy. At ten it began to rain, and it rained all day.
27	6 m	24.5	S E 2	
	11		E 3	
	1 a		N E 4	Rain.
	4	21.5	N 1	Scattered clouds.
28	7 m	23.0		
	2 a	23.5	S W 1	[lightning.
29	6 m		S W 3	Towards evening drizzl. rain and
	2 a	25.5	N W 2	Scattered clouds; air very cool.
30	6 m	23.5		
	2 a	21.5	S W 1	Fair: in the morning it began to grow cloudy; at night lightning, hard rain, and some thunder.
31	6 m	22.2		

September

September - 1748.

323

D.	H.	Ther	Wind.	The Weather in general.
1	7 m 2 a	20.0 21.5	N W 2	Scattered clouds. Clouds passing by. Rain and strong winds all the afternoon.
2	6 m 2 a	19.0 20.5	N W 1 N W 0	Scattered clouds all day. At night a great halo round the moon.
3	6 m 2 a	21.5 23.0	W S W 0 S 1	Scattered clouds. It became more cloudy. In the evening appeared a great halo round the sun.
4	6 m 12 n 2 a	23.3 27.5 24.0	E 1 E S E 1	Scattered clouds.
5	6 m 12 n	24.5 26.5	S E 3	Scattered clouds.
6	6 m 1 a	27.0 28.5	S E 2	Scattered clouds, At night a great halo round the moon, and the sky very red.
7	6 m	27.5	E 3	Dark sometimes. The sun shone through the clouds.
8	12 n	28.5	N E 2	Scattered clouds.
8	6 m 1 a	26.0 26.5	N N E 2	Scattered clouds all day.
9	6 m 1 a	24.5 24.5	N 1	Scattered clouds all day.
10	5 m 1 a	24.0 24.5	N N W 1	Fair.
11	6 m 2 a	23.2 25.0	W N W 1	Fair. At night a halo round the moon.
12	6 m 1 a	24.0 26.0	A Calm.	Fair, and very hot.
13	5 m 1 a	25.5 26.5	S E 1	Fair.
14	6 m 1 a	25.5 26.5	S E 1	Fair; but a cool wind all the morning.
15	5 m 1 a	23.0 27.5	S E 1	Scattered clouds. It grew more cloudy. In the evening and ensuing night, violent rain and winds.
16	5 m 2 a	21.5 21.5	N N E 1	It rained hard all day.

D.	H.	Ther	Wind.	The Weather in general.
17	5 m	25.5	N W 1	Cloudy.
	1 a	21.0		Scattered clouds.
18	6 m	13.0	Calm.	Fair.
19	1 a	24.5	N N E 1	Fair all day.
20	6 m	14.0	N E 1	Scattered clouds.
21	6 m	11.0	N E 0	Scattered clouds.
	1 a	23.0		
22	7 m	10.5	N E 1	Fair.
	1 a	25.0		
23	6 m	11.0	N N E 1	Fair.
	2 a	28.0		
24	6 m	14.0	N E 1	Fair.
	2 a	28.0		It grew dark. At night came rain, which continued late.
25	6 m	18.0	N W 1	Dark. At 8, scattered clouds.
	2 a	28.0	N E 1	Scattered clouds.
26	6 m	15.5	N N E 1	Fair.
	2 a	27.5		
27	6 m	17.0	N E 1	Cloudy. Fair at 8, and all the morning.
	2 a	27.0		Cloudy.
28	6 m	14.0	N E 1	Fair and cloudy alternately.
	2 a	20.0		
29	7 m	15.5	N E 1	Cloudy.
	2 a	20.5		Fine drizzling rain.
30	7 m	16.0	N E 0	Alternately fair and cloudy.

O. S. R.

October 1748.

325

D.	H.	Ther	Wind.	The Weather in general.
1	6 m	19.0	S 1	Fair. Scattered clouds at 8.
	2 a	18.5		Scattered clouds. Dark towards night.
2	6 m	18.5	S W 0	Cloudy.
3	6 m	15.0	N W 1	Cloudy.
	1 a	18.0		Scattered clouds. Late at night a great halo round the moon.
4	7 m	6.0	N W 1	Fair.
	1 a	16.0		
5	7 m	2.0	N 1	Fair.
6	7 m	2.0	N E 1	Fair.
	1 a	18.0		At night a great halo round the moon.
7	6 m	7.0	E N E 1	Cloudy. Fair at 9, and all day.
8	6 m	14.0	E N E 1	Cloudy. Scattered clouds at 8.
9	6 m	18.0	S S E 1	Rain all the morning.
	3 a	23.0		Cloudy.
10	6 m	20.0	S W 0	Fog, and a drizzling rain.
	2 a	23.0		Fair.
11	7 m	20.0	S W 1	Fog, which fell down. Fair at 8.
	2 a	26.0		Fair.
12	6 m	8.0	W N W 1	Fair all day.
	8		W 1	
	2 a	20.0	W S W 1	
13	6 m	2.0	W N W 1	In the morning, hoary frost on the plants.
	2 a	17.0	W S W 0	Fair all day.
14	6 m	5.0	S S W 0	Fair.
	2 a	21.0		
15	6 m	4.5	S S E 0	Fair.
	2 a	24.0		
16	6 m	11.0	E N E 0	Cloudy.
17	6 m	8.0	N E 1	Cloudy.
	2 a	18.0		Cloudy. Violent rain all night.
18	6 m	12.0	N W 0	Cloudy.
	5 a	4.0	S W 0	
19	6 m	00.0	W S W 1	Scattered clouds.
	2 a	9.0		
20	5 m	01.0	W N W 1	Fair.
	2 a	9.0		
21	7 m	00.0	W 0	In the morning ice on standing water, white hoary frost on the ground; fair all day.
	1 a	15.0		

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20

October

D.	H.	Ther	Wind.	The Weather in general.
22	6 m	00.0	W 0	Fair.
23	6 m	4.5	N N E 1	Fair.
	1 a	16.0		
24	6 m	4.5	N 0	Fair.
	2 a	18.0		
25	6 m	4.5	S W 1	Fair. Air very much condensed in the afternoon.
26	6 m	4.0	S W 0	Fair.
	3 a	19.0		
27	6 m	1.0	S W 0	Fair.
	3 a	17.0		
28	6 m	9.0	E 2	Heavy rain all day.
29	6 m	14.0	W 1	Fair.
	1 a	20.0		At night I saw a meteor, commonly called the shooting of a star, going far from N. W. to S. E.
30	6 m	3.0	N W 1	Fair.
31	7 m	4.0	W 1	Fair.
	1 a	18.0		

November

November 1748.

327

D.	H.	Ther	Wind.	The Weather in general.
1	7m	3.0	S 1	Fair.
2	6m	4.0	N 0	Fair.
	3 a	18.0		
3	7m	7.0	N W 1	Fair.
	1 a	14.0	S E 0	
4	7m	1.0	S W 0	In the morning the fields were covered with white frost. A fair day.
	12 n	19.0		
5	7m	4.0	S W 1	Fair.
	1 a	17.0		
6	7m	4.5	N E 1	Fair.
	1 a	12.0		Towards evening somewhat cloudy.
7	7m	7.0	E N E 1	Cloudy.
	4 a	11.5		
8	7m	11.5	E N E 2	Drizzling rain.
	1 a	18.0	E S E 3	Heavy rain.
9	7m	17.0	S E 1	Drizzling rain.
	9m	15.0	S S W 1	At eight it cleared up.
	1 a	17.0		Scattered clouds.
10	7m	6.0	S S W 2	Fair.
	1 a	13.0	W N W 2	
11	7m	4.0	W S W 1	Cloudy.
	1 a	12.0		Scattered clouds.
12	6m	03.0	S W 1	Fair.
	2 a	11.5	N W 2	Cloudy.
	4	5.0		
13	7m	00.0	N N E 1	This morning ice on the water. Fair.
	2 a	5.5		Fair.
14	7m	0.5	N 3	Fair.
	1 a	8.0	N 2	
15	7m	3.0	S 2	A strong red aurora.
	1 a	8.0		Cloudy, and continual drizzling rain.
16	7m	4.5	W 1	Fair.
17	7m	01.0	W 1	Fair and cloudy alternately.]
	1 a	8.0		Sometimes drizzling rain.
18	7m	4.0	S 1	Fair.
	3 a	6.5	N W 2	
19	7m	03.0	W 0	Fair.
	2 a	11.5		

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20

November

D.	H.	Ther	Wind.	The Weather in general.
20	7 m	01.0	N N E 1	Fair.
	2 a		S 1	
21	7 m	15.0	S W 2	Fair.
	1 a	19.0		
22	7 m	20.0	E 1	Rain all day.
	2 a	10.0		
23	8 m	16.0	S 1	Cloudy, foggy, and rain now and then.
	8 a		S W 4	
24	7 m	00.0	W N W 3	Fair. [to-day.
25	7 m		N W 0	It was very cold last night, and fair
26			N W 0	Alternately fair and somewhat cloudy, and always pretty cold.
27				Fair; scattered clouds: pretty warm in the air.
28				Cloudy, foggy, and quite calm.
29				Somewhat cloudy.
30			N 1	Fair, and a little cold.

December

December 1748.

329

D.	H.	Ther	Wind.	The Weather in general.
1			N 1	Fair.
2			W S W 1	Fair, and cold; a great halo round the moon at night.
3			W S W 1	A pretty red aurora, however a fair day.
4	7 m	6.0	S S W 0	Fair.
	3 a	18.0		
5	7 m	5.5	N N E 1	
	4 a	9.5		
6	7 m	6.5	S S W 1	Cloudy.
	3 a	14.0		Somewhat fairer; hard rain in the next night.
7	7 m	13.5	S W 1	Cloudy.
	2 a	19.0		Fair.
8	7 m	5.0	S 1	Cloudy.
	2 a	13.5		Rain and wind next night; thick, but scattered clouds.
9	7 m	12.0	S W 2	
	2 a	10.0	W N W 2	
10			W N W 2	Scattered clouds.
11	7 m	2.0	S S W 1	Fair.
	2 a	12.5		
12	7 m	0.5	N E 1	Cloudy, rain, and fog all day from nine o'clock.
	2 a	10.5		
13	8 m	7.5	S W 0	Foggy, and cloudy.
	2 a	10.0		Next night a strong N. W. wind.
14	8 m	1.0	N W 2	Scattered clouds.
	2 a	2.0		
15	8 m	07.0	W N W 1	Fair and cloudy alternately.
	2 a	01.0		
16	8 m	01.0	W 1	Fair.
	2 a	1.5		
17	8 m	02.5	N W 1	Cloudy, some snow, the first this winter.
	2 a	00.0		
18	8 m	03.0	W 1	Fair.
	2 a	4.0		
19	8 m	1.0	W 1	Cloudy.
	2 a	8.0		Fair.
20	8 m	01.5	W S W 2	Scattered clouds: about six at night were quite red stripes on the sky, to the North.
	2 a	7.5	W S W 1	

D.	H.	Ther	Wind.	The Weather in general.
21	8 m	07.0	N 0	Fair.
	2 a	2.0		
22	8 m	04.5	S E 0	Fair.
	2 a	13.0		It grew cloudy in the afternoon.
23	8 m	13.0	S S W 0	Heavy rain.
	2 a	18.0		Foggy and cloudy.
24	8 m	13.0	W S W 0	Thick fog.
	2 a	17.0	S W 1	Fair; but late in the evening a hard shower of rain.
25	8 m	18.0	S 3	Last night was a storm, rain, thunder, and lightning.
	2 a	18.5	S S E 2	Heavy rain all day.
26	8 m	3.0	W 3	Last night a violent storm from W. and S. and heavy rain. The morning was cloudy, and some snow fell.
	2 a	3.5	W N W 3	Clears up.
27	8 m	04.0	W N W 3	Fair.
28	8 m	07.0	W 0	Fair.
	2 a	8.0		
29	8 m	3.0	N N E 1	Somewhat cloudy, and intermittent showers.
	2 a	13.0	— 0	
30	8 m	8.0	N N E 1	Cloudy and foggy all day.
	2 a	10.0	— 0	
31	8 m	6.0	W 3	Fair.
	2 a	4.0	N W 1	At night a halo round the moon.

January 1749.

331

D.	H.	Ther	Wind.	The Weather in general.
1	7 $\frac{1}{2}$ m	07.0	N W 0	Fair.
	2 a	4.0	— 0	
2	7 $\frac{1}{2}$ m	04.5	W N W 1	Alternately fair and cloudy.
	2 a	5.5	— 1	
3	7 $\frac{1}{2}$ m	2.0	N W 1	Cloudy.
	2 a	2.0	— 1	
4	7 $\frac{1}{2}$ m	02.0	W 1	Fair.
	2 a	11.0	— 1	
5	7 $\frac{1}{2}$ m	03.0	W 0	Fair.
6	7 $\frac{1}{2}$ m	03.0	W 0	Fair, but darkened towards night,
	2 a	14.5	— 0	with some snow.
	5 a	14.5	N W 3	
7	7 $\frac{1}{2}$ m	01.0	W N W 1	Somewhat cloudy.
	2 a	3.0	— 1	
8	7 $\frac{1}{2}$ m	04.0	W N W 1	Fair.
	2 a	8.0	— 1	
9	7 $\frac{1}{2}$ m	03.0	W N W 1	Aurora, cloudy, heavy rains at
	2 a	8.0	— 1	night.
10	7 $\frac{1}{2}$ m	15.0	S 2	Cloudy, and showers, some snow at
	2 a	2.0	W 4	night; at 9 morn. W. S. W. 3; at
	4 a			11. m. S. W. 4; at 2 aft. W. 4.
11	7 $\frac{1}{2}$ m	03.0	W N W 3	Cloudy.
	2 a	04.0	— 3	
12	7 $\frac{1}{2}$ m	04.0	W N W 3	Fair.
	2 a	01.5	N N W 2	
13	7 $\frac{1}{2}$ m	07.5	W N W 2	Fair.
	1 a	03.0	— 2	Cloudy.
14	7 $\frac{1}{2}$ m	05.5	W N W 1	Cloudy, and snows all day; it lay
	1 a	02.0	— 1	above two inches thick.
15	7 m	07.0	W N W 0	Fair.
	2 a	3.0	— 0	
16	7 m	08.9	N W 3	All the last night W N W 4.
	8 m	09.0		Fair all day.
	2 a	08.0	— 1	
17	7 m	011.0	N N E 0	Cloudy; snows all day, and the en-
	7 a	09.0	— 0	suing night.
18	7 m	012.0	N W 1	Cloudy, and snows in the morning,
	10 m	011.0	— 1	fair all the afternoon, and the ther.
				at 011.0: snow lay five inches deep.

January

D.	H.	Ther.	Wind.	The Weather in general.
19	7 m	015.5	W 1	Fair.
	1 a	010.5	— 1	
20	7 m	012.5	W 1	Fair.
	2 a	07.0		
21	7 m	022.0	W N W 0	Fair.
	2 a	03.0	W 1	
22	7 m	05.0	W 1	Fair.
	2 a	01.0	W 1	Cloudy.
23	7 m	010.0	W N W 1	Fair; a great halo round the moon at night.
	7 a	3.0	— 1	
24	7 m	01.0	N N E 0	Cloudy, snows all day.
	2 a	4.0	N E 0	
25	7 m	00.0	W N W 0	Fair.
	2 a	4.0	W 0	
26	7 m	013.0	W N W 1	Fair.
	2 a	1.0	— 1	Cloudy; at three in the afternoon began to snow.
27	7 m	07.0	W 1	Fair; halo round the moon at night.
	2 a	00.0	— 1	
28	7 m	01.0	W N W 1	Cloudy; snows almost all day.
	3 a	4.0	— 1	
29	7 m	05.0	N N E 1	Fair.
	3 a	03.0	— 1	
30	7 m	013.0	W N W 1	Fair; halo round the moon at night.
	3 a	4.0	— 1	
31	7 m	04.0	W N W 1	Fair; halo round the moon at night.
	3 a	8.0	— 1	

February

D.	H.	Ther	Wind.	The Weather in general.
1	7 m	03.0	W N W 1	Fair; a halo round the moon at night.
	1 a	11.0	W 1	
2	7 m	5.0	W N W 0	Fair.
	2 a	6.0	W 0	
3	7 m	00.0	W 0	Fair.
	2 a	19.5	— 0	
4	7 m	5.5	W 0	Cloudy; at ten at night wind
	2 a	11.0	4 a. N N E 2	N N E 3. snow.
5	7 m	06.0	N N W 2	Fair.
	1 a	03.0	N W 2	
6	7 m	010.5	N W 0	A cracking noise was heard in all
	2 a	3.0	W S W 1	houses the night before. Aurora.—
				Fair all day,—at 7 in the morn.
				N W 0—at 9, W N W 1—at
				11, W 1—at 2 in the afternoon,
				W S W 1.
7	7 m	01.0	N N E 1	Cloudy—fair—at 7 in the morn.
	2 a	1.0	N W 1	N N E 1—at 9, N 1—at 10,
				W N W 1—at 12, N W 1.
8	7 m	09.0	N W 0	Fair.
	2 a	7.0	W 1	
9	7 m	03.0	W 1	Fair.
	3 a	16.0	— 1	
10	7 m	7.0	W 1	Pretty clear; a violent storm with
	1 a	11.0	S S W 4	rain all the ensuing night.
11	7 m	9.0	S S W 2	Fair; rain towards night; at night a
	1 a	11.0		light similar to an <i>Aurora Borealis</i>
				in S. W.
12	7 m	4.0	S S W 3	Fair; about nine at night a faint <i>Au-</i>
	1 a	10.0		<i>rora Borealis</i> in S W.
13	7 m	2.0	W N W 2	Cloudy.
	3 a	5.0	N W 2	Fair.
14	7 m	06.0	N W 1	Fair.
	3 a	02.5	W N W 2	Flying clouds.
15	6 $\frac{1}{2}$ m	010.5	N W 1	Fair; at eight in the evening an <i>Au-</i>
	2 a	03.0	W N W 0	<i>rora Borealis</i> .
16	6 $\frac{1}{2}$ m	013.0	W N W 0	Fair.
	2 a	00.0	N W 1	
17	6 $\frac{1}{2}$ m	02.0	W N W 1	Cloudy and snow; wind all the after-
	2 a	00.0	W 1	noon long.

D.	H.	Ther	Wind.	The Weather in general.
18	6½ m 2 a	2.0 00.0	W N W 1	Cloudy.
19	6½ m 2 a	03.0 01.0	N N E 2	Cloudy; rain all day, mixed with snow and hail.
20	6½ m 2 a	1.5 4.5	N W 1	Cloudy.
21	6½ m 4 a	00.8 4.0	N W 0 N N E 1	Cloudy; at 5 in the morn. we heard a waterfall near a mill, about a mile S S of us making a stronger noise than common, tho' the air was very calm—at 10 began a rain which continued the whole day.
22	6½ m 2 a	3.0 3.5	W N W 2	Fair.
23	6½ m 4 a	06.0 4.0	W 2	Fair. Some clouds gathered round the sun.
24	6½ m 3 a	4.0 10.0	S S W 1 W 1	Cloudy.
25	6 m 2 a	3.0 1	W N W 0	Alternately fair and cloudy.
26	6 m 3 a	012.0 02.0	N N W 1	Fair; cloudy at night; at eight in the evening was a halo round the moon, and the clouds in S. quite red.
27	6 m 3 a	04.0 01.0	N 2	Cloudy, and snow in the morning; but fair at 4 in the afternoon.
28	6 m 3 a	04.5 03.5	N W 4 W N W 4	Flying clouds.

March

March 1749.

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D.	H.	Ther.	Wind.	The Weather in general.
1	6 m	09.0	W N W 2	Fair. A great halo round the moon at night.
	3 a	01.5		
2	6 m	06.0	N W 2	Fair. A faint halo round the moon at night.
	4 a	2.5		
3	6 m	04.0	N W 1	Fair. Cloudy afternoon. About 8 at night the clouds in S. W. were quite red. At 9 it began to snow.
	2 a	6.5	S 1	
4	6 m	0.5	E S E 1	Cloudy. Heavy rain at night.
	2 a	7.0	S 1	
5	6 m	4.0	W 1	Alternately fair and cloudy. The next night calm.
	2 a	11.0	W 3	
6	6 m	4.0	W 2	Fair.
7	6 m	00.0	W S W 1	Alternately fair and cloudy in the morning. In the afternoon cloudy, with intermittent rain and thunder.
	2 a	8.0		
8	6 m	2.0	W N W 0	Fair. About 8 at night we saw what is called a snowfire to the S.W.—See Vol. II. p. 81.
	3 a	20.0	W S W 2	
9	6 m	5.0	N 1	Fair.
	3 a	13.5		Cloudy. Snowfire in S. W. about 8 at night.
10	6½ m	5.0	S S E 1	Cloudy. Snow and rain all day, and next night.
	2 a	6.5	S E 1	
11	6 m	9.0	S S E 1	Cloudy and heavy rain in the morning. Clears up in the afternoon.
	3 a	14.0	W 1	
12	6 m	9.0	N N W 0	Cloudy in the morning. Clears up at 10. Towards night cloudy, with rain.
	3 a	15.0	E N E 0	
13	6 m	9.5	N N E 2	Cloudy, with heavy rain. Fair at 4 in the afternoon.
	2 a	8.0	com. N 3	
14	6 m	4.0	W N W 2	Fair.
	2 a	10.0		
15	3 m	00.0	W S W 0	Fair. Cloudy towards night.
	3 a	13.0	W 2	
16	6 m	2.5	N N E 3	Snow violently blown about all day.
	3 a	01.0		
17	6 m	01.0	N W 2	Cloudy. Clears up at 8 in the morning.
	3 a	5.0		
18	6 m	02.0	W S W 0	Fair. The fields were now covered with snow.
	3 a	4.0	W 2	

D.	H.	Ther	Wind.	The Weather in general.
19	6 m	02.0	W N W 1	Fair.
	3 a	6.0	N W 2	
20	6 m	05.5	W 0	Fair. Cloudy towards night.
	3 a	11.5	S W 1	Cloudy.
21	6½ m	2.0	S S E 0	Cloudy. Intermittent showers.
	3 a	14.5		
22	6 m	10.0	S S E 0	Cloudy.
	3 a	19.5		
23	6 m	15.0	S S E 1	Heavy rain.
	3 a	19.0		
24	6 m	8.0	S W 1	Fair.
	3 a	15.0		
25	6¼ m	6.5	W N W 3	Fair.
	3 a	11.0		Flying clouds.
26	6 m	00.0	W N W 2	Fair.
	5 a	11.0	S W 2	Flying clouds. About 8 at night a snowfire on the horizon in S. W.
27	6 m	3.0	W N W 1	Fair.
	3 a	9.0		
28	6½ m	3.0	S 1	Rain all the day, and the next night.
	3 a	12.0	11 a. NNW 3	
29	6 m	1.0	N N W 2	Fair.
	2 a	6.0		
30	6 m	03.0	E 1	Fair. Cloudy at noon : begins to snow, which continues till night, when it turned into rain.
	2 4	4.0	S E 1	
31	6¼ m	5.0	N 1	Cloudy.
	3 a	14.0		

April

April 1749.

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D.	H.	Ther	Wind.	The Weather in general.
1	6 m	5.5	N N E 1	Rain in the morning,—afternoon,— and in the night.
	3 a	3.5	E 1	Snow, with much thunder and light- ning.
2	6 m	0.5	N N E 1	Snow almost the whole day.
	3 a	0.5		
3	6 m	02.0	N W 1	Fair.
	3 a	9.0		
4	6 m	02.0	W 1	Fair.
	3 a	16.0		
5	6 m	00.5	N 1	Fair.
	3 a	19.0	S W 1	Sun very red at setting.
6	6 m	4.0	S W 1	Fair.
	3 a	23.0		
7	6 m	13.0	S 2	Fair. Cloudy afternoon.
	3 a	24.0		About 7 in the evening it began to rain, and continued till late at night.
8	7 m	9.0	N W 3	Flying clouds.
	3 a	13.0		
9	6 m	1.0	N 1	Alternately fair and cloudy. Snows in the evening, and at night.
	3 a	7.0		
10	7 m	2.5	N E 1	Cloudy. Began to rain at ten, and continued all day till night.
	3 a	6.5		
11	6 m	5.0	N E 1	Rain almost the whole day.
	3 a	9.0		
12	6 m	2.0	W N W 2	Fair. Afternoon cloudy, with hail and rain.
	2 a	13.0		
13	6 m		N W 2	Fair.
	2 a		S W 1	Cloudy.
14	6 m		E 1	Cloudy; fair at eight. Cloudy to- wards night.
	2 a			
15	6 m		E 1	Almost quite fair.
	2 a			
16	6 m	6.5	W N W 2	Fair.
	2 a	13.5	— 1	
17	6 m	7.0	S 1	Alternately fair and cloudy.
	3 a	16.0	S W 1	Rain.
18	7 m	6.0	N 0	Fair.
	3 a	18.0	N W 3	

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April 1749.

D.	H.	Ther.	Wind.	The Weather in general.
19	5 $\frac{1}{2}$ m	2.0	NNW 0	Fair.
	3 a	20.0	W 2	
20	6 m	2.0	SW 0	A hoar frost this morning. Fair and very hot all day.
	3 a			
21			SW 1	Fair; with hot vapours raised by the sun.
22	5 m	13.0	SO	Almost fair.
	3 a	23.0		
23	5 $\frac{1}{2}$ m	11.0	W 1	Fair.
	3 a	25.5		
24	6 m	12.0	S 1	Cloudy, intermittent drizal. showers.
	3 a	22.0		
25	6 m	18.0	SO	Rain the preceding night, and now and then this day. At night thunder and lightning.
	3 a	24.0		
26	6 m	28.0	W 1	Fair.
	3 a	30.0		
27	6 m	17.0	W 2	Fair.
	3 a	25.0		
28	6 m	7.0	W 0	Fair.
	3 a	24.0		
29	6 m	7.0	N 2	Fair.
	3 a	17.0	E 2	
30	5 m	3.0	E 1	Flying clouds.
	3 a	15.5	S 1	

May.

May 1749.

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D.	H.	Ther	Wind.	The Weather in general.
1	4 m	0. -	S 0	Hoar frost this morning. — fair.
	3 a	18.5	S W 1	
2	5 m	1.0	W 1	Fair.
	3 a	23.0		
3	5 ¹ m	4.0	W 1	Fair.
	3 a	27.5		
4	5 m	16.0	W 1	Fair.
5	5 m	13.0	S 3	Flying clouds.
	3 a	27.0		
6	5 m	14.5	N 0	Fair.
7	5 m	13.0	N 0	Somewhat cloudy.
8	5 m	4.0	N 0	Fair.
9	6 m	14.0	S 1	Rain almost the whole day.
	3 a	14.0		
10	6 m	13.0	S S W 0	Intermittent showers.
	3 a	16.0		
11	5 m	12.0	W S W 0	Fair.
	3 a	28.0		
12	5 m	13.0	W N W 2	Fair.
	3 a	20.0		
13	5 m	9.0	N W 1	Fair.
	3 a	18.5		
14	5 m	00.5	N W 0	Fair.
15	5 m	9.0	S S W 2	Cloudy.
	3 a	20.0		Rain.
16	5 m	17.0		Cloudy.
	4 a	23.0		
17	5 m	20.0	S 1	Rains intermittently all day; and lightens very much at night.
	3 a	24.0		Fair.
18	5 m	13.0		Fair.
19	5 m	17.0	W 2	Fair.
20	5 m	19.0	W 1	Fair.
	3 m	24.0		
21	6 m	20.0		Fair.
22			S W 1	Fair. Very hot.
23	5 m	17.0	S W 1	Fair.
	3 a	33.5		
24	12 m	32.0	S W 1	Fair.

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May.

340

May 1749.

D	H.	Ther	Wind.	The Weather in general.
25	8 m	23.0	S W 1	Fair, and very warm.
	2 a	28.0		
26	8 m	21.0	W N W 2	Flying clouds; at night thick clouds, with storm and rain.
	3 a	25.0		
27	7 m	17.0	W 2	Thick, scattered clouds.
	2 a	25.0		Pretty cool.
28	7 m	15.0	W 1	Flying clouds.
	2 a	25.0		
29	7 m	16.0	W 2	Flying clouds.
	2 a	25.0		
30	5 m	13.0	W N W 1	Fair.
	— a	25.0	W 1	Cloudy.
31	5 m	13.0	S W 1	Somewhat cloudy.
	1 a	27.0		Fair.

June

June 1749.

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D.	H.	Ther	Wind.	The Weather in general.
1	5 m	23.0	S W 1	Rain the preceding night.
2			S E 1	Morning cloudy,—clears up at ten,— flying clouds.
3	7 m	24.0	S W 1	Flying clouds; afternoon, thunder- clouds, with rain from the N W.
4	3 a	26.0	N W 1	Flying clouds.
5	5½ m	15.5	S 1	Fair.
	3 a	22.0		
6	5 m	18.5	S W 1	Alternately fair and cloudy.
	3 a	23.0		
7	All d	20.0		Cloudy and rainy.
8	6 m	15.5	N W 0	Cloudy.
	3 a	23.0	— 1	Flying clouds.
9	5 m	13.0		Fair.
10	5 m	11.0	S W 1	Fair.
	3 a	22.5		
11	7 m	20.0	N 1	Flying clouds.
	2 a	33.0	S W 1	Thunder-storm, with rain.
12	6 m	23.0	N 0	Fair.
	3 a	32.0	S 2	Somewhat cloudy.
13	5 m	19.0	S E 2	Almost fair.
	3 a	27.0		
14	6 m	26.0	S 1	Fair.
	3 a	25.0		Thunder-clouds, with rain.
15	6 m	18.0	N 0	Fair.
	3 a	26.5		
16	6 m	20.0	N N E 1	Fair.
	2 a	28.0		
17	5½ m	18.0	N 0	Fair.
	3 a	27.5		
18	5 m	21.0	E S E 1	Fair.
	3 a	32.0	N E 1	Thunder, with heavy showers.
19	6 m	20.0	N N W 1	Fair.
	3 a	27.0		
20	5 m	18.0	S 1	Fair.
	3 a	26.0		Cloudy.
21	5 m	23.0	S W 0	Cloudy, with some showers.
22	5 m	9.0	W 1	Fair.
23	6 m	17.0	S 1	Fair.
	— a		N W 1	Cloudy.

Y 3

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neral.

ick clouds,

June

D.	H.	Ther	Wind,	The Weather in general.
24	6 m	20.5	S 1	Cloudy, afterwards fair.
	— a		S W 1	Thunder and rain.
25	5 m	23.0	S 1	Fair.
	2 a	32.0		
26	5 m	12.0	N 1	Fair.
27	6 m	1.0		Fair.
28	6 m	18.0	S 1	Fair.
	1 a	35.0		
29	7 m	6.0		Fair.
30	5 m	11.0	S 1	Fair.
	3 a	31.0	W 1	

July

D.	H.	Ther	Wind.	The Weather in general.
1			N 3	Flying clouds.
2	5 m	7.5	N 2	Fair.
3	8 m	26.0	N 1	Fair.
	2 a	28.0	— 1	Thunder-storm, and rain at night.
4	6 m	20.0	S 1	Cloudy; intermittent showers in the afternoon.
	— a		N 2	Fair.
5	4 a	26.0	W 1	Cloudy; rain at night.
6	5½ m	18.0	— 1	Rain all the preceding night; fair in day-time.
7	4½ m	17.0	S W 1	Fair.
8	6 m	16.0	N 0	Alternately fair and cloudy. A halo round the sun, in the forenoon.
9	7 m	21.0	S W 0	Rain the preceding night. In day-time, cloudy, with some showers.
	3 a	22.0	— 1	Fair; sometimes flying clouds and showers.
10	4½ m	18.0	S W 0	Fair.
	3 a	24.5	— 1	Fair.
11	5 m	17.0	S S E 1	Fair.
	2 a	26.0	— 1	Fair.
12	5 m	22.0	W 1	Fair.
13	6 m	20.0	S S W 1	Fair.
	3 a	33.0	— 1	Fair.
14	5 m	21.0	W S W 1	Fair.
	2 a	28.0	— 1	Fair.
15	5 m	26.0	N N E 1	Fair.
	3 a	28.0	— 1	Fair; sometimes cloudy.
16	5 m	14.0	S 0	Fair.
	10 m		S S E 1	Cloudy.
17	5 m	19.0	S 1	Fair.
	3 a	24.0	— 1	Cloudy.
18	5 m	15.0	N N E 0	Fair.
	2 a	25.0	— 0	Fair.
19	5 m	19.0	S S W 1	Cloudy; rain.
	— a			Pretty fair.
20	5 m	19.0	S 1	Fair.
	3 a	24.0	— 1	Cloudy; some rain.
21			S 0	Fair.
	3 a	27.0	— 0	Flying clouds.
22	5 m	16.0	S W 2	Fair.
	3 a	27.0	S W 2	Fair.

D.	H.	Ther	Wind.	The Weather in general.
23	6 m	19.0	S S W 1	Alternately fair and cloudy.
	3 a	28.5	— 1	
24	6 m	20.0	S W 1	Fair.
	3 a	29.0	— 1	
25	5 m	20.0	W S W 0	Fair.
	3 a	29.5	— 0	
26	5 m	21.0	S 0	Fair.
	3 a	30.0	— 1	
27	5 m	22.0	W 1	Cloudy; intermittent showers.
	3 a	21.5	— 1	
28	6 m	17.0	W 1	Fair.
	3 a	27.0	— 1	
29	6 m	16.0	N W $\frac{1}{2}$	Fair; flying clouds at night, and showers.
	2 a	24.0	— 1	
30	6 m	14.0	W N W 1	Fair.
	2 a	26.0	— 1	
31	6 m	16.0	E 1	Cloudy; rain almost all day.
	3 a	22.0	— 1	

August

August 1749.

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D.	H.	Ther	Wind.	The Weather in general.
1	6 m	22.0	N E 1	Cloudy. Some showers.
	3 a	28.0	— 1	
2	4½ m	16.0	N E 1	Fair.
	a		S E 1	Cloudy. Fair towards night.
3	5 m	13.0	S W 2	Fair.
4	m		N E 2	Cloudy. Some showers.
	2 a	21.0	— 2	
5	m		N E 1	Fair.
	a		S W 1	
6	5 m	16.0	N E 3	Heavy rain all day.
	3 a	16.0	— 3	Some thunder.
7	6 m	13.0	E S E 1	Cloudy. Frequent showers.
	3 a	16.0	— 1	
8	6 m	16.0	S W 1	Cloudy. Some showers.
	3 a	27.0	— 1	
9	6 m	14.0	S W 1	Flying clouds.
	1 a	20.0	— 1	Rain at night.
10	6 m	14.0	S W 1	Flying clouds.
	3 a	24.0	— 1	
11	6 m	15.5	W 1	Cloudy.
12	6 m	14.0	W 1	Flying clouds.
	2 a	25.0	— 1	
13	7 m	15.5	N W 1	Fair.
	2 a	30.0	— 1	
14	6 m	16.0	N E 2	Fair.
	2 a	26.0	— 2	
15	6 m	14.0	N E 1	Fair.
	2 a	28.0	— 1	
16	5 m	14.0	S E 1	Fair. At night thunder and rain.
	3 a	26.0	— 1	
17	5 m	14.5	S o	Flying Clouds.
	3 a	27.0	— o	
18	5 m	16.0	W 1	Thunder and rain in the morning. At
	3 a	29.0	— 1	ten in the morning flying clouds.
19	6 m	17.0	W 1	Fair.
	3 a	30.0	— 1	
20	5 m	16.5	S W o	Fair.
	3 a	28.0	— o	
21	5 m	17.0	S W 1	Fair.
	2 a	29.0	— 1	
	5 a	27.0	— 1	

D.	H.	Ther.	Wind.	The Weather in general.
22	5 m	19.0	N E 2	Rain all day.
	3 a	17.5		
23	5 m	16.5	S W 3	Rain early in the morning. At 10 m.
	2 a	22.5	— 3	flying clouds.
24	6 m	13.5	S W 2	Flying clouds.
	2 a	22.0	— 2	
25	5 m	7.0	S W 2	Fair.
	4 a	20.5	— 2	
26	5 m	13.0	N E 1	Alternately fair and cloudy.
	3 a	18.0	— 1	Much rain this afternoon.
27	5 m	10.5	S W 1	Flying clouds.
	2 a	23.0	— 1	
28	5 m	10.0	S W 1	Fair.
	2 a	20.0	— 1	
29	5 m	13.0	N E 2	Fair.
30	5 m	11.0	N E 2	Fair.
31	6 m	13.6	S 1	Fair and cloudy alternately.
	3 a	18.5	— 1	Intermittent showers.

September

September 1749.

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D.	H.	Ther.	Wind.	The Weather in general.
1	5 $\frac{1}{2}$ m	14.5	N N W 1	Fair.
	3 a	30.0	— 1	
2	5 $\frac{1}{2}$ m	9.0	N 1	Fair.
	2 a	18.0	S S W 1	
3	5 $\frac{1}{2}$ m	7.5	S 1	Somewhat cloudy. Now and then fair.
	2 a	20.0	— 1	
4	6 m	14.0	S 1	Now and then a shower; and in the intervals fair.
	2 a	17.5	— 1	
5	6 m	14.0	N E 2	Fog. Rain all day. Now and then thund.
6	10 $\frac{1}{2}$ m	15.0	N E 2	Fog, and drizzling rain all day.
	10 $\frac{1}{2}$ a	15.0	— 2	
7	7 m	17.0	S W 1	Fog and rain.
	3 a	22.0	— 1	Fair.
8	5 $\frac{1}{2}$ m	15.0	S S W 1	Fair.
	4 a	28.0	— 1	
9	5 m	17.5	E N E 2	Fair.
	3 a	25.0	— 2	
10	5 $\frac{1}{2}$ m	16.0	N E 2	Fair.
	3 a	26.0	— 2	
11	5 $\frac{1}{2}$ m	15.0	E N E 0	Fair.
	3 a	25.0	— 0	
12	7 m	14.5	N N E 1	Fair.
	a		S W 1	
13	5 $\frac{1}{2}$ m	14.0	N E 1	Fair.
	1 $\frac{1}{2}$ a	24.5	— 1	
14	5 m	15.0	N E 2	Fair.
	1 a	22.5	— 2	
15	5 $\frac{1}{2}$ m	16.0	N N E 3	Fair. Forenoon, a halo round the sun.
	2 a	19.0	— 3	
16	5 $\frac{1}{2}$ m	8.5	N N E 1	Fair.
	3 a	20.5	— 1	
17	5 m	12.0	S W 0	Fair.
18	6 m	17.0	S W 1	Fair.
	3 a	27.0	— 1	
19	6 m	14.0	S W 1	Fair.
	3 a	26.0	— 1	
20	6 m	19.0	S W 1	Fair.
	a	26.0	— 1	Cloudy. Rain towards night.
21	6 m	15.0		Fair.
	3 a	19.5		
22	6 m	13.0	E 0	Somewhat cloudy.
	3 a	22.0	— 0	

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September 1748.

D.	H.	Ther	Wind.	The Weather in general.
23	6 m	14.0	S W 0	Fair.
24	6 m	18.0	S W 2	Fair. Rain at noon.
	2 a	26.0	— 2	Flying clouds in the afternoon.
25	7 m	16.0	W 1	Alternately clear and cloudy.
	2 a	17.0	— 1	
26	8 m	12.5	N E 1	Fair.
	3 a	11.5	— 1	Cloudy and rainy.
27	6 m	9.3	N 1	Rain all day.
	3 a	14.0	— 1	
28	6 m	8.0	S W 1	Heavy rain all day.
	3 a	14.0	— 1	
29	6 m	8.0	S 1	Fog.
	1 a	13.0	— 1	Flying clouds.
30	8 m	14.0	S W 2	Drizzling rain.
	2 a	18.0	— 2	Somewhat clear.

October 1749.

D.	H.	Ther	Wind.	The Weather in general.
1	7½ m	9.0	N W 1	Rain.
	n		— 1	Somewhat fairer.
2	7 m	2.0	W 1	Hoarfrost this morning. Fair all day.
3	6 m	3.5	S W 1	Fair.
	1 a	12.0	— 1	
4	6 m	11.0	S 1	Rain.
5	6 m	10.5	N E 1	Cloudy.
	a	11.0	— 1	
6	6½ m	10.0	E N E 1	Rain all day.
	3 a	12.0	— 1	
7	6½ m	10.0	E N E 1	Flying clouds.
	2 a	14.0		
8	6½ m	7.0	S 1	Fair.
	3 a	18.0	S 1	

METEORO.

METEOROLOGICAL OBSERVATIONS,
 Made by Mr. JOHN BARTRAM, near *Philadelphia*,
 During my Absence, in the Summer of the Year 1749.

June 1749.

D.	Ther	Ther	Wind.	The Weather in general.
	Morn	Aft.		
1	22	25	W	Cloudy.
2	20	27	W	Cloudy.
3	23	28	W	Showers.
4	22	28	W	Fair.
5	18	25	W	Fair.
6	18	25	W	Cloudy.
7	22	22	N E	Cloudy.
8		21	N E	
9		21	N	
10	14	22	E	
11	22	23	E	
12	25	25	E	
13	23	25	E	
14	25	27	E 3	
15	24	28	E	Fair.
16	22	26	E	
17	23	27	E	
18	25	27	E	
19	23	24	N W	
20	17	26	W	
21	24	26	W	
22	18	27	W	
23	15	29	W	
24	22	30	W	
25	22	31	W	
26	23	30	N	
27	19	32	W	
28	24	36	W	
29	25	37	W	
30	25	36	N	

July

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July 1749.

D.	Ther	Ther	Wind.	The Weather in general.
	Morn	Aft.		
1	21	30	W	
2	18	27	NW	
3	26	28	S W	Heavy showers.
4	24	36	NW	
5	22	32	W	
6	22	34	NW	Rain.
7	20	35	W	Hard showers.
8	20	35	N E	Rain.
9	20	29	N	Fair.
10	16	29	N	Fair.
11	17	33	NW	Fair.
12	20	35	W	Fair. Rain at night.
13	22	33	W	Fair.
14	26	30	W	Hard showers.
15	20	29	N	Fair.
16	21	30	E	Rain.
17	29	29	N E	Cloudy.
18	18	19	N E	Rain.
19	18	33	W	Fair.
20	19	33	W	Fair.
21	22	31	W	Fair.
22	23	23	W	Heavy showers.
23	23	25	W	Heavy showers.
24	20	36	W	Fair.
25	27	36	W	
26	28	32	W	
27	24	30	W	Fair.
28	19	27	W	Fair.
29	23	30	W	Rain.
30	30	34		
31	21	34		

August

August 1749.

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H.	Ther	Ther	Wind.	The Weather in general.
	Morn	Aft.		
1				
2	18	32		
3	17	30		
4	18	33		
5	22	39	W	
6	18	37	N 2	
7	17	27	W	
8	14	25	NW	
9	12	24	NW	
10	13	24	NW	
11	11	25	NW	
12	14 ¹	30	NW	
13	18	31	NW	
14	18	30	W	
15	15	30	W	Rain.
16	23	33	N	
17	14	34	N W	
18	18	37	W	
19	18	25	S W	
20	20	26	N E	Rain.
21	20	25	N W	
22	23	34	N W	
23	17	34	W	
24	18	30	W	
25	20	32	NW by W	
26	10	24	N W	Fair.
27	12	20	N W	Fair.
28	13	23	N W	Fair.
29	22	24	W	Fair.
30	17	25	E	
31	20	29	E	

End of Vol. II.

September

August

H.	Ther.	Ther.	Wind.	The Weather in general.
	Morn.	Aft.		
1	19	30	E	Hard showers.
2	18	20	E	Rain.
3	19	25	E	Rain.
4	22	25	E	Foggy.
5	23	21	N E	Cloudy.
6	23	37	N E	Cloudy.
7	24	34	N E	Cloudy.
8	24	32	N E	Cloudy.
9	23	33	N E	Rain.
10	23	32	W	Rain.
11	19	25	N E	
12	13	25	N E	
13	12	20	N E	
14	12	33	N E	
15	13	27	N E	
16	20	26	N E	
17	17	27	E	
18	16	34	S E	
19	12	30	S W	
20	17	26		
21	17	25	W	
22	15	30	E	
23	20	29	E	
24	21	29	W	
25	23	28	W 3	
26	20	15	E by N	Thunder storm.
27	15	19	NW	
28	10	20	NW	
29				
30	6	26	W	

October 1749.

D.	Ther.	Ther.	Wind.	D.	Ther.	Ther.	Wind.
	M.	Aft.			M.	Aft.	
1	13	25	W	5	17	30	E
2	14	29	NW	6	18	30	E
3	8	15	N	7	16	21	NW
4	13	29	W	8	11	22	NW

End of Vol. II.

[illegible]

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E
E
NW
NW